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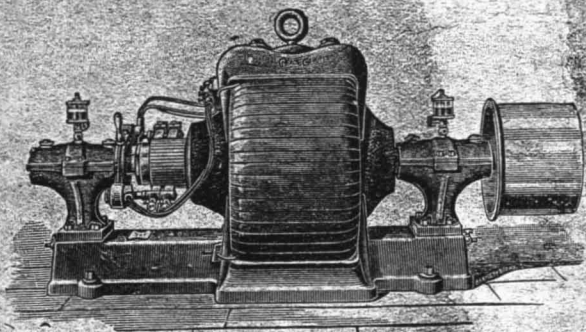
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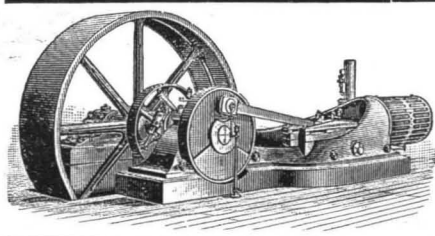
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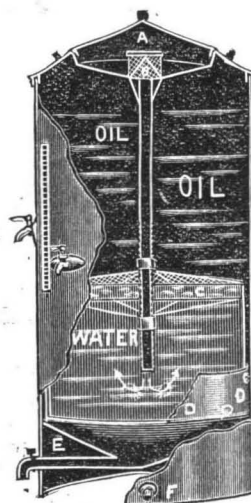
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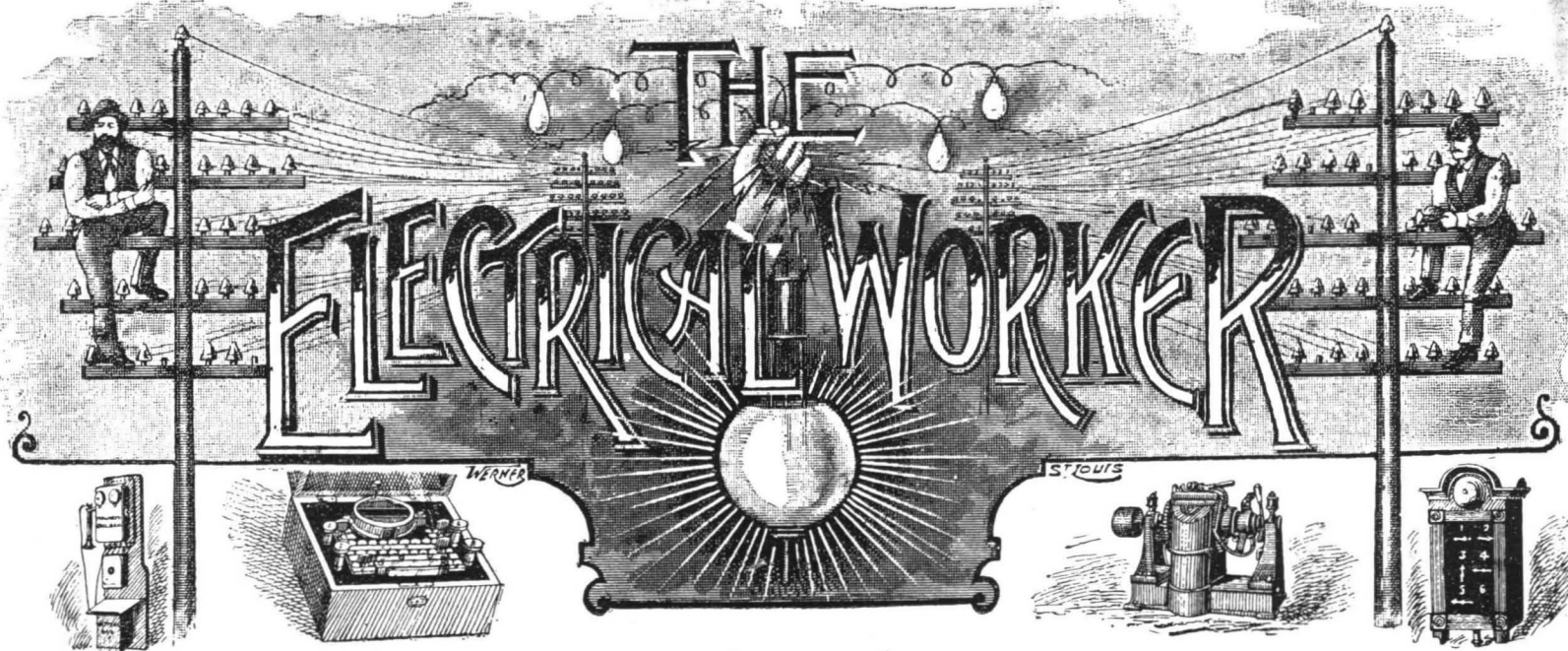
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Official Journal of the National Brotherhood Electrical Workers of America.

VOL. 1.

ST. LOUIS, JANUARY, 1893.

No. 1.



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The men who organized the Brotherhood—Delegates to the First Convention of the National Brotherhood of Electrical Workers.

JAN 1893

Locating Trouble on Arc and Power Circuits in Central Station Work.

By C. O. POOLE.

As the title of this paper indicates, its object is to deal with the process of locating trouble on overhead construction in arc and power transmissions, rather than to suggest remedies or attempt to improve the line work.

When a lineman is sent out on a circuit to find trouble, he knows three things: First, the circuit he has to go out on; second, that there is a ground, a cross, a short-circuit, or an open circuit; and last but not least, that if he does not find it in short order he will hear from the superintendent.

If it be an open circuit and he has the advantage of working in daylight, the first thing he does is to ground both legs of the circuit at the switch-board in the station; then with an assistant go to the first convenient lamp on the circuit, open the circuit at the lamp, ground one side of his magneto bell and test both ways toward the grounded ends in the station. Suppose he is working at the first lamp on the positive leg he tests that wire back to the station and fails to get a ring; he knows then that the open circuit is between the station and where he has made the test. He then traces the circuit back toward the station until he finds the break. If, however, he should get a ring when he tests the positive wire toward the station, he then tests the other end of the wire, and finding it open continues his search in that direction, until he passes the break and gets a ring on the negative leg; he then knows, of course, that the point lies between the place of testing and his present position. If a circuit should open at night during the run, the following method is sometimes used to advantage: The lineman instructs the dynamo tender to leave the machine on the circuit; he then arms himself with a pair of spurs and a short piece of wire, and for once the magneto bell is not in it. His knowledge of the circuit enables him to soon reach a pole where both legs of the circuit are on the same cross-arm. Buckling his spurs on he quickly mounts the pole, and baring the circuit wires, brings into service the short piece of wire before mentioned, with which he strikes both of the circuit wires. If a flash is the result, he knows that he has to go further out on the circuit. After climbing another pole some distance further on, and going through the same process of striking the wires, and fails to get a flash, he concludes of course the trouble lies between the first and second test. As soon as the broken ends are reached and spliced together the lights immediately start up. That is one advantage of having the machine on the circuit, while there is the disadvantage of working with the machine that is liable to jump at you with about two or three thousand volts, which is by no means a pleasant thing to handle on a wet night.

In order to overcome this danger and to allow the lineman to become a little more sociable with the circuit he is working on, the company I am with has had constructed a machine to put on this circuit, instead of the regular arc machine; the boys call it the "jigger." It is simply a combined motor and dynamo connected together on the same shaft. It is placed on a roller platform, and stands in the corner of the station until wanted. The motor is wound for 10 amperes, constant current, and has a capacity of about 2 horse-power. The dynamo is wound for constant potential, with an output of about 15 amperes at 200 to 300 volts. When required, the motor part is connected in the arc circuit and is run up to speed. The dynamo terminals are connected to a suitable plug, and a plug put in the circuit that is open. You will readily understand, if the wires be short-circuited as before mentioned, a current will immediately be generated and a flash will be the result.

Not knowing of any better methods than the ones above described for locating a break in the open circuit, I can not offer any suggestions that would be of benefit. Of course, if the wire should break, and one or both ends fall to the earth, and make a fairly good ground you would by means of the Wheatstone bridge and galvanometer be able to make an intelligent guess, that is all. There are so many doubtful points to be considered in measuring lamp circuits that it makes a calculation almost worthless. For instance, if you had to depend upon the path through the carbons of a lamp, the resistance may be a fraction of an ohm, or it may be 10 ohms. Again, if the carbon be burned out in a lamp that depends upon the current to keep the cut-out in contact, then you would have to deal with the resistance of the shunt winding, which would amount to 200 or 300 ohms.

Another element of uncertainty that might be mentioned is that of induction. I remember one case in particular. After personally going over all the lamps on the circuit, which was about 15 miles long and consisted of No. 6 B. & S. wire, I attempted to measure it with the bridge and gal-

vanometer. I found it impossible to get a satisfactory reading. One instant 30 or 40 ohms would almost balance, and the next instant it would take 400 or 500 ohms to bring the needle to anything near a standstill, while in the next instant it would be found down at zero, with the negative sign before it. The bridge was one of the best, and the galvanometer a Thomson reflecting instrument; both having been previously tested and found correct. The only way that I could account for the phenomena was in the fact that for some distance the lines ran parallel on the same pole with a live circuit. So, everything considered, in my opinion the bridge and galvanometer is not a satisfactory method of testing lamp circuits. I will say, however, in this connection that in some few cases, by the use of the bridge, I have determined the position of grounds and short circuits on trunk lines and on circuits where the trouble occurred between the station and the first or last lamp.

In instances of this kind, the uncertainty of lamp measurements need not be taken into consideration, and the question resolves itself simply into a matter of measurements and calculations. As an example, suppose the trunk line of No. 6, B. & S. wire be two miles long, and the wire becomes short-circuited at an unknown distance from the station. If on measuring it you find the resistance to be 4.176 ohms; and upon referring to a table of resistances you find the resistance of one mile of No. 6 wire to be 2.088 ohms; dividing 4.176, the measured resistance of the circuit, by the resistance per mile of wire 2.088, the result will be 2; meaning, of course, that the wire measured was two miles long, and the circuit consisting of two wires, would make the distance from the station to the point of trouble just one mile. If the short circuit had been caused by two grounds, their position could have been determined by the same process as just described; the only difference being to connect one post of the bridge to one side of the line and the other to ground. Then if you found a resistance of 2.088 ohms, and considering the ground resistance to be nil, you would know at once that the ground on that side of the circuit would be one mile from the station; assuming of course that the measurements be made in the station. After getting your distance, and telling the linemen where to find the trouble, it is a matter of but a few minutes until the circuit is clear, and there is light once more. Now, if the linemen had not been told where to find the trouble, and simply to go out and find the short circuit, it would have been necessary to trace the wires from the station until the place of trouble was reached; or by taking the magneto he could have cut the wires and tested both ways. This might have to be repeated several times; and aside from the disadvantage of having a full line of splices would have taken much longer to locate the trouble.

We have seen how an open circuit and a short circuit are located. Now, let us follow the linemen in locating crosses between two circuits. Suppose No. 2 and No. 3 to be crossed. The first thing to be done is to test for a ground. If either of the circuits are grounded it must be found and cleared before the cross can be considered. If the circuit be free from grounds, one of the circuits in question then is grounded in the station, say No. 2 be the one; then with the magneto bell he starts out on No. 3 circuit. The process is similar to that described in finding an open circuit so far as the method of testing is concerned; the difference between the two lies in the fact that in the first case you are trying to find the reason you do not get a ring, and in the second case the reason you do get a ring. After proceeding to a lamp on No. 3 circuit, and taking the wires out of the binding posts of the lamp, one side of the magneto is grounded, by connecting a wire to a convenient water-pipe or gaspipe, or if the earth be moist by driving a screw-driver into the ground and connecting to that; then with the other side of the bell, the lineman can connect the line wire and test toward the station. If he gets a ring, the point of contact between the two circuits, of course, lies between the station and the place of testing. This will be apparent if you bear in mind the fact that No. 2 circuit is grounded in the station, and when the ground is made on one side of the bell it is equivalent to connecting it to No. 2 circuit, and the only reason the connection is not made to the circuit direct is because it may be a mile or more distant.

Having dealt with the open circuit and short-circuit, and a cross; now let me take up that root of trouble, the "ground." I will venture the assertion that nine-tenths of the outside trouble in central station work is either directly or indirectly traceable to grounds, and if there be any central station men present this evening, I believe they will bear me out in the statement.

When the lineman is called upon to clear one cross, he has nine calls for grounds; and it is equally true regarding open circuits, although short circuits are frequently found to consist of two

grounds. I will recite an instance of this a little further on. If I treat the subject of grounds a little more fully than the others, I do so for two reasons. First, because it is of more importance than any of the others, on account of the more frequent occurrence; second, because it offers an opportunity to use instruments in locating the trouble. The instrument I use is a voltmeter, reading from 0 to 3,000.

The magneto bell method of locating a ground is the same as the one described, that of opening the circuit and testing both ways. With the voltmeter, it is necessary, of course, to make the test while the circuit is running. I have found it a good practice to go over all the circuits at the switch-board with a ground wire while the lamps were burning. In this way I have frequently detected grounds on a circuit where other methods had pronounced them all right. If, upon striking a circuit with a ground wire, you succeeded in drawing out a flash about a yard long, and probably have to take two steps backward to break it, you will have a kind of a foggy idea that there is a ground on that circuit; and if, upon examination, you find half your mustache and one eyebrow gone; and it has taken about 10 minutes to recover your eyesight, then you feel pretty sure that you have found a ground circuit.

For the benefit of the uninitiated, I will say, that this singeing process will occur but once; for the next time the neophyte approaches a live circuit with a ground wire, it will be with a 10-foot pole, and the wire safely fastened at the proper end of it.

Having found a ground circuit, the next thing to do is to find the ground on the circuit. If there be but one ground on the circuit, it will make no difference with the burning of the lights; but if there is one ground there is sure to be another sooner or later, and then the trouble begins. For this reason, and several others that might be mentioned, it is desirable to keep the lines clear of grounds at all times.

But returning to our problem of locating grounds, we will take the circuit from which comes the flash, for example call it No. 10, and in handling it, treat it with all the respect and deference due its importance. First, with the voltmeter take the electromotive force across the terminals on the switch-board; do not be satisfied with one reading, but take several at intervals of two or three minutes, for the voltage of an arc circuit is anything but constant. Suppose the average for several readings be 2,500 volts. By turning to your lamp list you may find that No. 10 circuit has 51 lamps of the so-called 2,000 candle power. For convenience, we will assume the current to be 10 amperes; some systems use this current, others a little less. Again, suppose the circuit to be 10 miles long of No. 6 B. & S. wire. The resistance of one mile of this wire, as before stated, is 2.088 ohms; then 10 miles would equal 20.88 ohms. Now using Ohm's law of $E \text{ equals } R \times C$, we have 208.8 volts, giving us the electromotive force required to overcome the resistance of the line circuit. This 208.8 volts deducted from the total electromotive force of the circuit, 2,500 volts, leaves a remainder of 2,291.2, being the amount absorbed by the 51 lamps on the circuit. This would give an average of nearly 45 volts per lamp; just about the proper voltage when burning a $4\frac{1}{2}$ -ohm arc. In the calculation with which we are dealing it is of course necessary to take into consideration the 208.8 volts lost in the line. If we divide this 208.8 by the number of lamps on the circuit it will give an average per lamp of a trifle over 4 volts; this added to the average lamp voltage will make a total of 49 volts; so that 49 is the constant to be used in our dealings with No. 10 circuit. We will now connect one side of our voltmeter to ground, and the other side to the positive side of the circuit. If we get a reading of 980 volts, for instance, and divide this by our constant of 49 volts, it gives us 20; which means, of course, that the ground lies between the 20th and 21st lamp on the positive side of the circuit. If now we connect to the negative side and ground, and get a reading of 1,520 volts, by bringing our constant into use we divide 1,520 by 49 which equals 31—locating, the ground between the 31st and 32d lamp on the negative side of the circuit; precisely the same result as with the first test, and proving beyond a doubt the correctness of the first calculation. We are about to put our instruments away and resolve to have that ground cleared the first thing in the morning, when our dynamo tender informs us that the machine on No. 10 is running very light; he thinks there are some lights cut out on it, as he had just noticed it flash. Connecting our voltmeter between the ground and positive side as before, 980 volts is the result; just the same as we had left it a few minutes ago. Connecting now to the negative and ground, we find our reading to be 540 volts, instead of 1,520 as before. Dividing 540 by the constant 49, gives us 11, showing conclusively that another ground has

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appeared on the circuit between the eleventh and twelfth lamp on the negative side. Now disconnecting the instrument from the ground and placing it across the terminals instead of a reading of 2,500 volts, we get but 1,520 volts. This divided by 49 equals 31 lamps left burning on the circuit; 31 from 51, the total number, leaves 20 lamps cut out by the grounds.

The number of lamps cut out could have been calculated without taking the terminal potential, by simply adding the two ground readings and deducting their sum from the terminal potential previously obtained, and dividing the result by the constant 49. All central stations have or should have maps of their circuits, showing on what streets they run, and the location of the lamps. If such maps be at hand we take out No. 10 circuit map, and counting 20 lamps from the station on the positive leg we locate one ground, and counting 11 lamps from the station on the negative leg, locate the other. Now when we call the lineman we do not simply tell him there are two grounds on No. 10, but we tell him to go to the corner of Twenty-first and B streets for one and Fifteenth and A streets for the other. If the maps above referred to are not to be had then you have to depend upon the lineman's knowledge of the lamps and circuits.

A short time ago I had a very peculiar case of ground to deal with; it had been raining and storming for several days, and circuits without ground were held at a premium. One of our day circuits of 50 lamps was reported out; not a lamp on the circuit burning. A test showed the circuit to be grounded. Linemen were sent out on the circuit, but after tracing it from one end to the other, failed to find the trouble. The machine was kept on the circuit all the time, running at 10 amperes, on almost a dead short circuit. When the first lineman failed to find the trouble another was sent out with the same result. Things were becoming interesting. I took the voltage of the circuit and got a reading of 40 volts—about that—I don't quite remember the exact figures; between the positive side and ground, about 13 volts; between the negative side and ground, about 27 volts, showing, as had been reported, that every lamp on the circuit was out. By the method described in locating a short circuit on trunk lines, I determined the number of feet of wire from the station to the ground on the positive leg, that being the nearest one to the station, and with a lineman started out to find the cause of all the annoyance. I spaced the distance off with my eyes as near as I could, and in 15 minutes from the time we left the station the 50 lights were shining forth in all their brilliancy, and the innocent telephone wire was credited with another knock out. The other ground was found a little later, where the voltmeter had located it.

INCANDESCENT INFRINGEMENT.

The Edison Company Gets a Restraining Order in St. Louis.

A suit of the utmost importance to many people in St. Louis holding electric light stock, and to users of the brilliant little incandescent lamps as well, was filed in the United States Circuit Court yesterday. The title of the suit is the "Edison Electric Light Company and the Edison General Electric Company, of New York, vs. the Columbia Incandescent Lamp Company, of St. Louis, and J. H. Rhotamel, its president, and A. C. Garrison, treasurer." The bill of complaint is a printed pamphlet, containing allegations used in other suits by the same plaintiffs against other electric light companies throughout the United States in support of the exclusive right to the Edison patent.

The matter was in litigation in New York for years in an action against the Sawyer-Man Company, which resulted in a final victory for the Edison company. Immediately after final decree was entered in this case a suit was entered in the United States Circuit Court for the Western District of Pennsylvania against the Westinghouse Electric and Manufacturing Company, which resulted in another victory for the Edison people, and injunction suits were begun against the Perkins Electric Company and the Mather Electric Light Company. The reason of this great activity, the attorneys for the complainant state, is that the infringing companies, as soon as they saw the validity of the patents sustained, began turning out and selling lamps as fast as possible, in order to get rid of as many as they could before the suit, which was inevitable, was filed.

The patent under which the suits have been brought was issued in January, 1880, for a period of seventeen years, so it has but four years to run, and the Edison company desires to have its competitors removed from the field by 1897, that it may kill opposition to an effort to secure an extension of its patent rights.

Judge Thayer granted a temporary restraining order forbidding the Columbia Company from manufacturing or selling lamps until February 1, and commanding its officers to appear before him on that day and show cause why a permanent injunction should not be issued against them.

Litigation in Chicago.

The Sunbeam and the Illinois Electric Light Companies, manufacturers of incandescent lamps, shut down their factories yesterday and will not resume operations until after Saturday, and only then in the event that they beat the Edison Company's injunction suit against them for infringement of patent. Judge Grosscup issued an order Saturday restraining them from shipping the bulbs, but they evidently thought it best to quit altogether until a decision as to their rights in the case had been rendered. So at noon the 200 men employed in the Sunbeam factory, on Ogden Avenue, were told to go home, and the 100 employees in the Illinois establishment on South Canal Street received similar notice. At the Sunbeam works Mr. Cameron, the manager and president, ordered that the names and addresses of the employees be taken that they might be quickly placed at work again, if advisable, and then he left on the first train for New York to confer with stockholders and secure more legal counsel. Expert workmen were at once put at work by the Sunbeam people to contrive a lamp which in no way be construed to interfere with the patents of the Edison folks.

Samuel Insull, President of the Chicago Edison company, said: "Since 1882 the Edison people, under whose patents we operate, have been fighting these infringements. The first decision was rendered last December against the United States Lighting Company, of New York, when the works—practically owned by the Westinghouse people—were closed. This litigation cost our people \$1,000,000.

"The Sawyer-Man Company of New York, which manufactured 100,000 lamps a day, was closed by injunction last month. This suit, tried in the United States Circuit Court of Appeals in New York, is the one in which the Edison Company relied. A clause in the decision said:

Every one of the manufacturing corporations, the competitors of the Edison companies, commenced their operations with a knowledge of the existence of the patent in suit. They were controlled by business men of intelligence and experience. Their promoters and managers may have believed, and probably did, that the patent could not be successfully maintained. But they entered upon the business with an understanding of its risks, and of the consequences which would befall them as infringers if the patent should be sustained. None of them can now be justly heard to say that an injunction, which is essential, if not indispensable, to the protection of the owners of the patent and their licensees, ought not to be granted because of the great pecuniary loss which may result. If in consequence of being deprived of the use of the lamps their investment in other electric apparatus will be greatly depreciated they must take the consequences.

"The Westinghouse Electric Manufacturing Company of Pittsburg has been enjoined, the works of the Mather Electric Company of Manchester, Conn., have been closed, and the Perkins Lamp Company is now under a restraining order. To-day proceedings were commenced against the Columbia Incandescent Lamp Company, of St. Louis. The Sunbeam Company, Chicago, was the largest independent company next the Sawyer-Man in the United States. It turned out daily about 5,000 lamps."—*Chicago Tribune*.

Boston, Mass., Jan. 23.—In the United States Circuit Court to-day, in the case of the Edison Electric Lighting Company to restrain the Beacon

Lamp Company, of this city, from manufacturing electric incandescent lamps, alleged to infringe Mr. Edison's patent, the Beacon Company filed about thirty affidavits, alleging that the incandescent lamp was not invented by Mr. Edison in 1879, as has been alleged, but by the German-American named Henry Gobel. The affidavits show that Gobel, after having experimented for several years, finally devised somewhat earlier than 1860 substantially the form of incandescent lamp now in use, and on which Edison claims the patent. The use of this lamp was necessarily limited by the fact that dynamos had not then been invented, but Mr. Gobel made many of these lamps for several years prior to Mr. Edison's alleged invention, and used them more or less continuously in lighting his store and dwelling, and for other purposes. The lawyers for the Beacon Company claim that the Gobel use of the incandescent lamp was a full anticipation of Mr. Edison's lamp and that Mr. Edison's patent is invalid.

NEW YORK, Jan. 25.—With reference to the defense offered by the Beacon Lamp Company in Boston in the suit of the Edison Company to restrain it from manufacturing electric incandescent lamps, alleged to be infringements on the Edison system, Mr. Franklin Pope, in the *Electrical Engineer* for to-day, gives a full history of the inventions by Gobel. The electrical lights manufactured by Gobel in New York in 1859 are claimed by the Beacon Company and by many expert electricians to antedate and anticipate Edison's inventions.

Mr. Pope recalls Gobel's frequent appearance in the streets of New York just before the war, with his somewhat crude but effective apparatus for making incandescent light, which apparatus the Hanoverian philosopher exhibited to the public along with a huge telescope, also made by himself, for a small consideration. Heinrich Gobel was born in Springer, Germany, in 1818; he pursued various experiments in galvanic and magneto-electric machinery under Prof. Monighausen before coming to this country in 1848. He then established a little optician's shop in New York, continuing his experiments with electricity. One night he astonished the citizens and called out the fire department by erecting an electric arc light on his roof, supplied by about eighty cells. One day he discovered by burning out some wood from an iron ferrule that the carbonized fibers were conductors of electricity. This led him to construct an incandescent lamp in a vacuum, the filament being held between two wires.

Mr. Gobel states as his reason for not coming forward sooner that he speaks English with difficulty and can not read it at all, and thought that the lamp was not valuable in the way he used it, as it was too expensive to be anything but a plaything.

Electric Signals.

The recent railway accidents in England have aroused fresh interest in the question of improved systems of railway signaling. Maj. Yorke, in his report to the Board of Trade on an investigation just made, says: "Regulations of the most careful and satisfactory nature may be drawn up, but absolute compliance with them can not at all times be insured." And he suggests whether it would not be possible to adopt on busy sections of the lines some system of electrical interlocking which would prevent a signal man from lowering his starting signal without the permission of the man in the cabin next in advance. This suggestion is practically carried out in the marvelously ingenious signaling system of A. W. Szlumper, which has been brought before the institution of Civil Engineers. In this invention the attempt has been made, and apparently with success, to construct a system of signals so perfect as to prevent the possibility of accident either by misadventure or intentionally. In place of the ordinary block system the Sykes electric lock and block has been adopted throughout, and specially arranged for terminus working. Visual and audible signals are given. In this system a maximum of effectiveness and safety seems to have been attained by combining the electrical working of the absolute block system with the mechanical operation of the outdoor signals, controlled by the movement of trains passing over treadles fixed to the rails.

ELECTRICAL NOVELTIES.

A Photo-electric Detector.

News comes from Toledo, O., of the successful use there of a camera and flash light in the detection and identification of two young burglars.

This new photo-electric detector works as follows:

The flash light powder is placed in a small cup above a disk roughened on the under side, beneath which is a common lucifer match held vertically against it.

As the burglar enters he steps on the electric mat on the floor, thus closing the circuit. This throws a switch over so that the flash-light apparatus is now in the circuit. The spring which controls the disk over the lucifer match is set in motion, the match is lighted, and the flash-light material is ignited. Through the powder box containing the flash-light runs a light fuse wire, which is a part of the circuit controlling the operation of the drop-shutter of the camera.

Therefore, as soon as the flash goes off, the fuse wire is destroyed, the circuit to the camera shutter is closed and the latter drops, the picture having been secured in the brief exposure of the plate. It will be observed that the exposure and flash are simultaneous, and the exposure is completed by the action of the light itself. The inventor has twice employed the apparatus to detect thieves, and each time with success.

Automatic Letter Express Delivery.

The new departure in express delivery in England, which was talked of sometime ago, has come into operation, although for the present it is only experimental. In front of the Royal Exchange has been placed an automatic boy, which is intended to be an adjunct to the express delivery of letters and parcels. On dropping in a penny the purchaser obtains an outer envelope, inclosing a small white envelope and card, on which the desired communication can be written, a small desk in the front of the box providing the necessary resting place. At the same time an electric bell calls a messenger from the nearest post office. Where express delivery of the parcel is desired, the arrival of the messenger must be awaited, but a letter may be deposited in the messenger receptacle for immediate dispatch. The necessary fee has, in every case, to be inclosed in the envelope addressed, and should the payment be insufficient, the addressee will be required to pay the difference. No postage is charged for this service, and the fee specified in the scale which are at the rate of 6c per mile, include train and car fares. If the sender wishes a cab to be used, he incloses the fare in the outer envelope, on which he inscribes "By cab." If this attempt to provide for the public demand for prompt service meets with success, the authorities of the post office are prepared to introduce the system in many other centers.

Electric Interurban Travel.

One of the most successful interurban electric roads in the country is operating between the twin cities of the Northwest, Minneapolis and St. Paul. This line has been so successfully operated that the local steam trains operating between those cities have been finally abandoned, as they could not compete with the low freight rates of the electric road. The latter charge much less than the steam roads. The latter will now accommodate the local traffic in a way by through trains.

The electric railway company now proposes to supply as much of the traffic between the twin cities as possible and in order to do this it will be necessary to put in another line and several branch lines with towns that would not be connected with the direct systems. Since the steam lines have discontinued their locals, several towns have been left without proper railroad facilities. By next spring the electric railway company proposes having all its new lines completed and ready to be operated.

Underground Electric Conduit Railway.

The results attending the operation of the underground electric conduit railway on the North Chicago Railway are so satisfactory that about two miles of similar track will be laid by the Rocky Creek Railway Company in Washington, D. C. The conduit used in Chicago is much like a cable conduit, 15 inches deep and 9 inches wide. The yokes are 20 inches deep, spaced 4 feet apart, and connected by a sheet-iron lining, about which the concrete is placed. Within this conduit are two copper wires along which the trolley runs. This trolley has four wheels, and is so arranged that it yields freely to every motion of the car above. Contact is made and broken by a lever much like those used on cable cars. The conduit for the Washington road is to be 18 inches deep and have connection to the sewers every 100 feet for drainage purposes. The copper conductors are to be a quarter of an inch in diameter. Outside the central portions of the city the overhead trolley will probably be used, since the underground system is still in an experimental stage and is only employed to comply with the recent law forbidding overhead wires in the center of the city.

A Motor as a Dynamo for Braking Purposes.

The electrician of the Sioux City Street Railway, I. B. Walker, has devised and put in operation on some of the cars on his lines, a controlling device which converts the car motor into a dynamo, when it is desired to stop the car. This is not an emergency brake, but intended for ordinary use. A lever, convenient to the driver, works a switch which is placed in a small box attached to the side of the controlling-stand of the car. A simple pull of the lever works a system of contacts which cut out the trolley and wire motors as dynamos. The momentum, of course, is the power which revolves the armatures and the effect is to overcome the driving force, and the car slackens its speed.

The resistance of the rheostat is worked off, the less speed is required, by throwing the switch-handle around as usual in starting the car. When a stop has been made or car reaches the bottom of the grade the brake-lever is moved back, which cuts in the trolley current again.

Long Distance Electric Roads.

If an electric road of considerable length is not constructed and put in operation in the near future it will not be for lack of schemes looking to this end. Several projects of this nature are being pushed, and some of them are apparently, quite near a realization to the extent that work has been begun on them. The most extensive perhaps of these projects is the Chicago and St. Louis, which it is proposed to construct on a system devised by Dr. Wellington Adams, and to which reference has been made before in these columns. Work has already been begun on the bed of this road. It is being pushed in both directions, and much of the right of way is reported as secured. Securities have been advertised for sale. It will be nearly 300 miles long, and it is proposed to make a speed of 100 miles an hour on it.

Perhaps the most pretentious scheme, which has backing of well-known names, is that of the Washington and Baltimore Electric Railway, which proposes to make a speed of about 60 miles an hour or a mile a minute. Some preliminary work, we are informed, has been done on this road, and its charter has been extended and surveys made for building the road to Philadelphia—three times as long as was originally proposed. A feature in connection with this project is the building of a grand boulevard connecting Washington and Baltimore, the electric road to be a part of the boulevard system.

In Washington it is proposed to build an electric road connecting the cities of Tacoma and Seattle. The scheme of this road is not so much to make high speed as it is to develop the intermediate country. In Western Massachusetts it is proposed to build lines connecting the electric roads of Springfield, Holyoke and Northampton: then by building branch roads connect all the larger adjoining towns. Some of these connections are now under way and others give evidence of being soon consummated, making, when completed, a system extending forty miles north and south and sixteen miles east and west, with branches.

One of the leading electrical firms of Austria has recently submitted to the Minister of Commerce a project to connect Vienna with Budapest. There are some novel features in the system as planned, and the proposed system is being much discussed by electrical experts in Europe.—*Electrical Industries.*

A New Mode of Producing Electrical Energy.

An English electrical paper is responsible for the statement that the nickel-in-the-slot principle is to be applied to the production of electrical energy. Hitherto the public has fed the automatic machine with coins in return for value. In the latest plan the process has been reversed. The public is now to receive money instead of paying it. To the person who turns a crank 100 times the machine will deliver up 2c. The crank is connected with a dynamo, and the 100 revolutions of the handle manufactures a quantity of electrical energy, which is eventually to be retailed by the owners of the machine for purposes of illumination and power. The plan is well spoken of in England, where there are thousands of persons out of employment, but whether it would answer equally well in this country where paupers are not so plentiful, is questionable. The plan has, however, one advantage; no man need go in want of a meal who can apply himself to the electrical automatic machine. The popularity of the scheme would seem to depend on the time and degree of force it would take to do the 100 turns, and it is presumed that fair wages could be made at the rate fixed. It is suggested that the invention is capable of wide application. Why should not every household be provided with one? Every member of the family might take a turn at the crank from time to time by way of exercise, and thus procure health and remuneration at the same moment. It would certainly be a most satisfactory arrangement if the energy hitherto expended on the dumb-bell practice could in this way be made to contribute to the expenses of housekeeping.

Rapid Transit in the West.

An apochryphal story from Pike's Peak avers that one Ross Ward, a railroader, tobogganed down the mountain on a board three feet long, one-and-a-half feet wide and with a cleat nailed on the bottom for a keel. The keel was fitted between the rack rails of the Cog railway. Ross slid nine miles with a descent of 8,000 feet, in 11½ minutes. This deed was on a \$25 wager. He offers to do it again for \$6,000,000.

JAN 1893

Will the "Hello" Girl Take the Place of the Train Dispatcher?

Car dispatching by telephone has been practiced for some time on several street railways, but it has not been adopted on any of the steam roads as yet save the Boston, Revere Beach and Lynn line. The superintendent of that road, C. A. Hammond, states that when the telephone replaced the Morse instrument on the railway some dozen years ago, there were times when the annoyances were very trying, to say the least, and wholly ruinous to that gentle and patient disposition with which every railroad man is blest. The lines would not be maintained properly, induced currents would occur, and similar difficulties tended to obscure the exact meaning of the message. Now, however, a copper metallic circuit is used, with sufficient battery power to allow a dozen or more instruments to be placed on a single circuit, the calls for which are readily distinguished by long and short rings, after the manner of a dot-and-dash code. It is stated that the induced currents are completely neutralized and the line is perfectly silent so far as disturbances due to such causes are concerned. The question naturally arises whether with such a perfect means of carrying on conversation at a distance the telephone can be safely relied upon to transmit railway messages, especially train orders. Supt. Hammond is of the opinion that, when surrounded by proper safeguards, this may be considered nearly or quite as feasible as by the present method of using the Morse telegraph. The sender is required to write his message a few words at a time, either from a written copy or as he transmits it. The receiver takes down the message on the proper blank, repeating each phrase as it is uttered. When the message or order is completed, the whole is read, including number, address, time and signature, whereupon the sender says "O. K.," which is written on the order, and then repeated by the receiver, after which the sender adds "O K.," to his own copy. No order is valid unless the letters "O K" appear in their proper place over the agent's signature. Before the order is detached from the agent's book, the person to whom it is addressed must sign the stub certifying that he has received the message and fully understands it. This simple method is reported to have worked extremely well, and on occasions when there have been such serious delays as to entirely disarrange the train service, the whole road, including the ferry, has been operated under special telephone orders issued directly by the superintendent, giving inferior trains rights over superior trains, changing meeting points, converting sections of the road from double to single track, running extra trains without notice and providing for relief in case of breakdown or washout. It has also been found that while technically skilled operators are not as necessary for handling the telephone as they are the telegraph, nevertheless a certain energy is important to secure good results, and to handle train orders by telephone successfully requires a well disciplined force of agents, all of whom must be held to a literal and undeviating compliance with the rules governing the method of taking and repeating orders down to the minutest detail.

Trouble from Electric Wires.

The multiplicity of high-tension electric wires in various cities and towns is causing great trouble with the local telephone service. One often hears a merchant say he can hear more distinctly over a long distance telephone line than over a local one. The explanation for that is, the local lines are often troubled

by induction from trolley wire circuits in the vicinity, while the long-distance is practically free from such interferences.

Whenever a local telephone service uses the earth for return circuits and an electric railway operates near by, one or the other must give up the use of the ground if good telephone service is required. As the railway company's service can not be effected by low tension electric wires, such as those used in telephone lines, it does not care who uses the earth, consequently the injured parties, who are telephone people, often have to adopt some method of relief. In many of the large cities the telephone people have adopted the complete metallic circuit.

An experiment recently tried by the Postal Telegraph & Cable Co., of Harrisburgh, Pa., shows how strong some of the induced currents are that telephone companies have to contend with. It was found that the ground between Harrisburgh and Carlisle, which are 18 miles apart, with the Susquehanna River between them, was so thoroughly charged with electricity from the return circuits through the earth of the trolley lines in Harrisburgh, that it was possible to operate a wire between the two cities without any battery.

The electrician of the cable company who made these experiments says, he has found a satisfactory remedy for the interference, but will not state what it is. The best and surest remedy we know of is a complete metallic circuit such as is now used in this and other large cities. Various devices which it was thought would be less costly were tried here, but it was finally realized nothing would make the telephone service thoroughly independent of the trolley wire or any other high-tension wire, device except a complete metallic circuit.

The latter, of course, is quite expensive in comparison to the old system where the ground was used for a return, and if the electrician above referred to has a new device which though less costly than the metallic circuit, yet as efficacious, it will surely be of great value to those companies that are troubled with induced currents, yet can not better themselves unless at a great expense, which they probably feel they can not stand just at present at least.—*Electric Train Lighting.*

Dancer Enveloped With Electricity.

It has remained for an Englishman, and one from the provinces at that, to outdo either Paris or New York in the electric-dance business. He brought out in London less than a fortnight ago, a most wonderful contrivance. A girl, and a very pretty one, ran upon the stage dressed in a costume somewhat like that worn in the serpentine dance, and about her dress and among the folds of her skirts flashed sparks and lights of all colors. She danced and kicked, twisted and turned, while the lights continued to flash. Revolving wheels, fountains and prisms of light played about her, appearing and disappearing, and changing with every smile and step. Imagine a handsome woman dancing in a rainbow while it turns about her, casting its different colors alternately upon her face and figure, and vivid flashes like miniature lightning playing about all. The dance was done without other sound than the music of the orchestra, and with no visible means of making the display.

The way the thing is done is no secret, though its technical explanation requires some little knowledge of electricity on the part of the reader. The young woman had fastened to her dress vacuum tubes, which are glass tubes from which the air has been exhausted. These are led by an induction coil giving a

long spark, which, when discharged through the vacuums, gave out the intense and varying lights at will. The tubes were made in various forms, and the dancer wore an India rubber dress to protect her from the discharge.

STROWGER AUTOMATIC TELEPHONE EXCHANGE.

This system has not been materially changed since it was patented, although some minor improvements have been made looking toward a greater proficiency of its working. Since the exchange at La Porte was opened the claims for this system have been verified, and it is reported as working to a high degree of satisfaction.

The purpose of this device, to do away with the central exchange, so that each subscriber may automatically connect himself with any other subscriber, has been accomplished without any hitch in the La Porte exchange, as also in the Fort Sheridan exchange, which the company has recently equipped and which has been accepted by the government. On each telephone are four or more keys, representing units, tens, hundreds, and, if needs be, thousands, while another key is "release." At the central is the automatic device, by which the various connections signaled for are made by means of electro magnets, levers, pawls, and a shaft with ratchet wheels and a connecting arm. The armature of the units' magnet is fastened to the unit's lever. To this lever is attached a pawl. This pawl engages the ratchet teeth of the units' wheel. The same is true of the tens and hundreds, so that when the signal is completed the central instrument makes the desired connection. There are as many machines at the central office as there are telephones, and each machine belongs to its particular instrument and has the same number. Thus, suppose 25 wants to call up 123. Number 25 presses his hundreds' key once, tens' key twice, units' key three times. In machine 25 at the central station, corresponding to his telephone, the arm is placed on contact point number 123, and the telephone is put in electrical circuit to 123. Now, to call 123, number 25 rings his bell, which rings up number 123. When the conversation is ended and the ear phones hung up, number 25 presses his release key, thereby actuating the release magnet on his central station automatic device, allowing the arm to return to its normal position, when the connection is broken.

The Stowger Company has under consideration the equipping of four or five exchanges with this automatic system.

The Stowger Company proposes to install one of its exchanges in the Electricity Building at the World's Columbian Exposition and has generously offered to connect the several exhibitors in the building with one another by this system. This will give the system a thorough test and at the same time demonstrate its practicability.—*Electrical Industries.*

EMANCIPATING THE CANAL MULE.

In his message to the Legislature, Governor Flower, of New York, remarks that only steam canal-boats capable of towing three to five boats each trip are now able to compete successfully with the railroads in the transportation of freight, and he suggests the inquiry, whether by the application to the canals of the "deadly trolley," it might not be possible to increase the speed of transit from the average rate of two miles per hour to the maximum which is possible without injury to the banks of the canal, which is about four miles per hour. He points out that abundant water-power for the purpose is available at many points along the line of the canals, which might be utilized at a comparatively small expense. He thinks the electric plant should be owned by the State, and expresses the opinion that the necessary power could be supplied to each boat at a price not exceeding sixty cents per day. We agree with the Governor that the scheme should be tried, and we believe it to be perfectly practicable. Doubling the speed would increase the carrying capacity of the canal four-fold, and would at the same time enormously diminish the cost of conducting transportation. Let the patient canal mule be emancipated. His brother, the car mule, was freed long ago by the trolley.—*Electrical Engineer.*

JAN 1893

THE ELECTRICAL WORKER.

OFFICIAL JOURNAL OF THE
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J. T. KELLY, SEC'Y & TREAS.,
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AS THE ELECTRICAL WORKER reaches the men who do the work, and recommend or order the material, its value as an advertising medium can be readily appreciated.

St. Louis, Mo., January, 1893.

Advertising Rates on Application.

SALUTATORY.

The ELECTRICAL WORKER needs no apology for its appearance. While at first it may seem that the field is already covered by the large number of able electrical papers that are published, yet the ELECTRICAL WORKER has a field exclusively its own. The electrical journals of to-day appear to be published for the benefit of the college professor and the college-bred electrical engineer. The great rank and file of electrical workers are considered as scarcely worthy of notice. The editors seem to think that the man who cannot solve all the problems in Euclid had no right to read an electrical paper. There are thousands of electrical workers in the United States who scarcely ever read an electrical journal on account of the formidable array of algebraic equations that bristle on every page.

At the convention of the National Brotherhood of Electrical Workers recently held in Chicago, it was decided to published a journal devoted to the interests of the electrical workers and the electrical industry, unhampered by trusts or cliques. The ELECTRICAL WORKER, edited and published by men who have devoted the best years of their lives in the hazardous work of their craft, who understand the needs and requirements of the electrical workers, will be a fearless champion of their rights and ever watchful of their interests.

With this brief notice we make our bow to the public, and hope that in their criticism they will consider the difference between climbing a pole and wielding an editorial pen.

TO OUR PATRONS.

To those who have been kind enough to give us their advertising patronage for this, our first, issue, we extend our sincere thanks, and hope they will receive orders aggregating many times the face value of their contracts with us. There is no reason why they should not do so, as our journal will be in the hands of every one interested in electricity. Each member of the Brotherhood is a reader, and where it falls to him to recommend or order supplies, naturally he will prefer a business house whose advertisement will appear in his own official journal.

Our advertising rates may not be as low as some trade journals with one-fourth the circulation, but as our present subscription list is 5000, and with prospects of doubling in the very near future, we can assure our patrons that they will be certain to get better results than from any other trade paper. As our rates will increase with our increase of circulation, we would advise our patrons to close yearly contracts at once.

NATIONAL BROTHERHOOD OF ELECTRICAL WORKERS OF AMERICA.

The Chronicle of Time had almost closed his volume on the Nineteenth Century—a century which will go down the ages as the transition period from the ancient to the modern, from the old order of things to the new. He had recorded in glowing colors the discoveries and progress of this age—how a struggling infant had grown to be a giant and given its name to the century—the age of electricity. But, ere he finishes the last chapter, let him pause to chronicle the birth of another infant, which, like its prototype, is destined to be an important factor in the moral, social and intellectual progress of the world—the National Brotherhood of Electrical Workers of America.

Let us see what apology it can offer for its existence.

While the electrical industry is new—the oldest branch so young that the President of the largest electrical company in the world was a grown man, a country doctor riding around on a pair of pill-bags before there was a telegraph line in existence; the telephone and electric lights were scarcely mentioned in the school books of the youngest of our members, and the electric railroads and the application of power are things of yesterday; yet from a humble beginning it has grown to such proportion that to-day there are probably more persons employed in it than any other industry except steam transportation.

With the introduction of this new and subtle force—harmless when handled properly, but more terrible than the thunderbolts of Jove in the hands of unskilled men—one would naturally suppose that the men who have to deal with it would be well paid for their work. But alas, the men who have carried the telegraph lines from ocean to ocean, who wove the web of telephone wires in every city and town, who erected the light

that transforms night into day, who constructed the machines and instruments by which this has been accomplished, who risk their lives daily that the community may have light, news, easy communication and protection, have been reduced year by year from their rightful position among skilled mechanics, until to-day, both in wages and social standing they are lower than any other trade requiring no greater amount of skill or manual effort, while the trade is overrun with unskilled men, and in consequence the danger to life and public safety is constantly increasing.

Only a few men in different cities seemed to realize where we were drifting to and set to work with a determination almost born of despair to stop the tide and place themselves and fellow-workers in that material, moral and social position the dignity of their trade entitled them to. A few local unions were started, the armature revolved and others saw the light until a dozen or more locals were organized. But it was soon evident that there should be one grand circuit from which each local could draw new life and energy, and thus establish a common bond of brotherhood among all electrical workers, and as a result the wireman, the lineman, he inspector, the armature-winder and others met in convention, and thus was born the National Brotherhood of Electrical Workers.

The St. Louis Local issued a call for a convention to meet in St. Louis, November 21, 1891, and seven unions responded. The delegates present, though few in numbers, were resolute and determined and pledged themselves not to cease from their work until every city in the United States would be organized.

The following officers were elected for the first year:

Grand President—Henry Miller.

First Grand Vice-President—E. C. Hartung.

Second Grand Vice-President—F. J. Heizleman.

Third Grand Vice-President and Grand Organizer—T. J. Frisnell.

Grand Secretary-Treasurer—J. T. Kelly.

OWING to an open circuit on our trunk line caused by the blowing of the main fuse of the Mekeel Printing Co. (ready cash), the publication of the ELECTRICAL WORKER has been delayed about one week. As it was necessary to make entirely new arrangements, and the second make-up went through with a rush, we hope our readers will overlook any mistakes they may discover. We hope that such delay will not occur again, and our readers can look for the second issue on Feb. 15th.

Put your advertisements where they will do the most good. Bring your merchandise before the eyes of those who have the ordering of such wares. Advertise in the ELECTRICAL WORKER, and your goods and address will become as familiar as "household words" to all interested in electricity.

JAN 1893

GOOD WORDS FROM OUR GRAND PRESIDENT.

One year has passed since the organization of the National Brotherhood of Electrical Workers. From a small beginning we have passed many of the older organizations, and our growth seems almost phenomenal. Our membership at the organization of the Brotherhood was scarcely 300, while to-day we have an organization extending from the Atlantic to the Pacific and from the Gulf to the Canadian border, with Locals in all the principal cities.

The members of the Brotherhood can justly feel proud of their work during the first year. In a number of cities the hours of work have been reduced from ten to eight, and wages have been increased from 10 to 50 per cent. As it is the duty of each member to assist a brother member and to explain all difficult points to him, the organization is one vast school where all are scholars and teachers in turn, and as a result the work done has been much better and has given more satisfaction both to the employers and the public. We all know how it was a few years ago. Each workman was jealous of the other, and instead of assisting one another, they would invariably work against each other, no one caring how the work was done and each blaming the other when anything went wrong, which was an every day occurrence. During the past year the the Brotherhood was unable to supply the demand for men, while there were a number of electrical workers looking for work all the time. This can easily be explained. Article II. section 1, of our constitution reads: * * * "To maintain a higher standard of skill, to encourage the formation of schools of instruction in Local Unions for teaching the practical application of electricity and for trade education generally, to cultivate feelings of friendship among the men of our craft, to settle all disputes between employers and employes by arbitration, to assist each other in sickness and distress, to secure employment, to reduce the hours of daily labor, to secure adequate pay for our work, and by legal and proper means to elevate the moral, intellectual and social condition of all our members." With such laudable objects in view, can it be wondered at that our organization has met with such favor everywhere, or that our members can so easily find work while other men are idle.

During the past we have had very few difficulties with our employers, and they were all settled satisfactorily to both parties.

Now, fellow-workmen, having the honor of being again elected your Grand President, I take this opportunity of calling upon you to assist me in the future as you have in the past. There is still a great deal for us to do, but by perseverance we will accomplish the objects we are organized for.

The electrical companies at present understand that it is for their benefit, as well as our own, that we should work hand in hand. They now see through the efforts of our organization they can procure

more skilled workmen, and it will be for their benefit to pay us accordingly.

In conformity with our constitution I would now urge on all Locals the necessity of opening a reading room or library as soon as possible, and have a regular course of instruction in the practical application of electricity. Also at the regular meetings when the 18th order of business is called—discussions on practical electrical subjects—that the president insist upon every member saying something, no matter how little, and in a short time you will find it necessary to limit their time. Just get them once started, and they will read and study up some subject, and say probably only a few words in an awkward manner, but they have started to read and think, and express their thoughts, and they see a new world open up before them. They have commenced to think.

Now that the Press Secretary is a regular officer, let us hope that each Union will select the right man for the right place. The Press Secretary is the local representative of the ELECTRICAL WORKER, and should furnish the paper with all the latest electrical news in his vicinity; also the condition of trade, new work, extension of plants; etc. We should aid our Grand Secretary-Treasury in every way we can to make the ELECTRICAL WORKER a success, both educationally and financially. You can aid him financially by getting subscribers and advertisements, and educationally by sending from time to time an article on some practical subject.

In conclusion, allow me to say that I have tried to do my duty in the past, and will endeavor to do so in the future, hoping, with your kind assistance, we may more than double our membership during the present year. Trusting that each member will do all in his power to further the interests of our organization, and wishing you all a happy New Year, I am, fraternally, yours,

HENRY MILLER.

Utilizing Niagara.

The Cataract Construction Company, the builders of the great tunnel, inlet canal and wheel pits for the purpose of generating electric power for transmission to Buffalo and other cities, will award the most important contract in the history of electrical progress in the world next month. This contract will be for the construction of a dynamo of 5000-horse-power capacity, the largest ever constructed, and also for a system of transmission which will conduct the electrical power from the generating station to the point of delivery with the least loss of power. Large electrical companies—three foreign and two in this country—have entered into competition for these contracts. These are the Oerlikon Electric Company, of Zurich; Brown, Boerrie & Co., of Baden; Cied l'Industrie-Electrique Company, of Geneva; General Electric Company, of New York, and the Westinghouse Electric Company of Pittsburg.

All the companies have submitted plans, designs and miniature plants for the inspection of the Cataract Company. These designs will be finally passed upon by Prof. George Forbes, the electrical expert of the company, of London, England. The manner of transmission will be by the alternating current, but the system to be employed is yet to be determined. Prof. Forbes has made a thorough examination into all foreign systems of under-

ground conduit cables and overhead system by insulation. What plans the American company will submit have not been disclosed. It is thought the conduit cable system will be used.

Electric Light Convention.

The National Electric Light Association will meet in this city February 28, March 1 and 2. The deliberative proceedings will be conducted in the Bell Telephone Building, and the headquarters for delegates will be at the Southern Hotel. There will be about 600 delegates present, composed of the leading electricians and managers of electric lighting plants in the United States. The St. Louis Electric Club is making arrangements to properly entertain the delegates. A banquet will be tendered the delegates, and everything possible will be done to make their stay as pleasant as possible. The sessions of the body will be devoted to the discussion of features of interest to both the public and lighting interests, and papers will be read by leading electricians on subjects the majority of which will be for the benefit of the managers of electric plants. A special feature of the meeting will be a lecture and demonstration by Mr. Nikola Tesla, one of the leading electricians of the age. Mr. Tesla is a young man and came prominently before the public about a year ago. At that time he delivered a lecture in New York City that placed him in the front rank of electricians. He was requested to go to London, and did so, where he delivered the same lecture. He has lectured but two or three times in this country. The lecture will be open to the public and will be given in Entertainment Hall. The convention will elect officers and transact such other business as may be deemed necessary. The present officers are: Jas. I. Ayre of St. Louis, president; E. A. Armstrong of Camden, first vice president; C. H. Wilmerding of Chicago, second vice president, and George F. Porter, of New York, secretary. Among the prominent electricians who will be present are: Elihu Thomson, Prof. Forbes, Prof. Stanley, Prof. Weston, Carl Herring, Frank Sprague and H. Ward-Lennard.

ELECTRICITY IN ST. LOUIS.

Now let some of the other cities turn on the search light and see what they can discover.

1. That St. Louis has more miles of electric railway than any city in the world, Boston not excepted.

2. That St. Louis has a longer electric road than any city in the world?

3. That electricity for railway purposes is transmitted to greater distances in St. Louis than in any city in the world?

4. That there is now building in St. Louis a system of electric railways in which the most modern conclusions of electrical and mechanical engineering are being introduced, and which marks a distinct step in advance?

5. That St. Louis has by far the largest arc lighting station in the world?

6. That St. Louis has the largest alternating incandescent station in the world?

These would seem to be sufficient to establish the greatness of St. Louis electrically. But they are not all.

St. Louis has the most comprehensive telephone system, and the best service of any city in America—probably in the world.

St. Louis has an electric street railway which is to-day doing a thriving business, where for part of its route it replaced a cable line and for the remainder of it replaced a suburban steam railway.

St. Louis has made the greatest use of the electric current in public displays, illuminations and festivities—witness the celebrations here last fall.

St. Louis is the home of the grandest conception of electrical engineering the world has ever seen—a double track electric air line nearly 300 miles in length, over which cars are to be operated at a speed of 100 miles per hour.

And St. Louis has its inventors, too, of world-wide fame. One of them made series incandescent lighting possible, and installed it in many cities. Another patented a fundamental idea of electric street railway mechanism, and is now before the courts for a hearing of his claim.—W. H. Bryan, in Age of Steel.

JAN 1893

CORRESPONDENCE.

ST. LOUIS UNION No. 1. NATIONAL BROTHERHOOD OF ELECTRICAL WORKERS.

Meets every Tuesday evening at B. P. and D. of A. Hall, 305½ Olive street. Dan Lafferty, President; M. A. Walsh, Secretary, 315 Chestnut street.

Local Union, 5221, A. F. of L., was one of the pioneer electrical unions of the United States. Started by twelve determined members, its membership soon increased to 200, and it was the first union to make a stand for eight hours and living wages, both of which it accomplished. But the members of the St. Louis union were not selfish. They wanted others to enjoy the same benefits, and early started to organize other cities with a view to forming a National organization of all electrical workers, and how well they succeeded can be judged from the fact that to-day we have a National Brotherhood, with locals in all the principal cities. The members of Local Union No. 1 can justly feel proud of what they have done, and will in the future, as they have in the past, continue to be leaders in the field of organized labor.

J. T. K.

LOCAL UNION NO. 3, NEW YORK.

Special Correspondence, N. Y. Jan. 20.

Local Union No. 3, of this city, held a meeting in Clarendon Hall last night, and formally withdrew from the Central Labor Union, Building Trade Section and the Board of Walking Delegates.

The contract with the Electrical Contractors' Association for one year, which promises to do away with all strikes in this trade, and insures its thorough organization, was indorsed.

The agreement which was signed yesterday is in part as follows:

That this agreement shall continue in effect for one year, and that if any refusal to renew the agreement for the next year, or any change on either side affecting this agreement is contemplated by either party hereto, such party shall give the other party six months' written notice, containing detailed information in relation to refusal or change.

Nine hours shall constitute a day's work, excepting that eight hours shall be a day's work on Saturday.

All overtime beyond nine hours per day shall be paid for at the rate of time-and-one-half, except that upon Sundays and legal holidays double time shall be paid.

The legal holidays, for the purposes of this agreement, shall be Christmas day, New Year' day, Washington's Birthday, Decoration day, Fourth of July, Thanksgiving day, Labor day, and Election day.

That the minimum rate of wages for journeymen wiremen shall be \$3 per day.

That wages shall be paid at least every two weeks.

From the date of this agreement members of the union shall work only for members of the Electrical Contractors' Association, and that members of the association shall employ only union men, provided, however, that nothing herein shall be construed as applying to affect the employment of labor as it exists at the time of this agreement.

This agreement shall apply only within a distance of twenty-five miles from City Hall, New York City.

No member of the association shall at any time have in its employ more helpers than journeymen wiremen.

In case of any claim for breach of contract on either side, such claim shall be presented to the other party in writing and the question whether a breach of contract has been committed shall be immediately submitted to arbitration, each party

hereto choosing one arbitrator and these two a third.

In case the claim for breach of contract be sustained by the arbitration, the party committing the breach of contract shall immediately pay to the other party hereto as liquidated damages, \$50 per day, for each day from the time said written notice was received by the party who is claimed to have committed the breach of contract, until breach of contract is rectified.

That no sympathetic strike be ordered by the union, and no sympathetic lockout by the association.

All applicants to the union hereafter shall pass an examining board before being eligible to membership in the union, said examining board being composed from two members from the union, two members of the association, and a fifth chosen by these four.

Said examining board shall determine the qualification and rating of applicants, and give to successful applicants a card indicating their qualification and rating.

All members of the unions at present in good standing shall pass said examining board within six months from date.

Said examining board to have six such examinations during the next six months.

After six months from this date there shall be an examination upon the first Monday of January, April, July and October.

Each member of said board shall receive \$10 for each such examination.

Neither party hereto shall do any act discriminating in any way against any member or applicant to either body, due to any action in the past.

This agreement shall go into effect February 1, 1893.

Signed by E. S. Keefer, President, and Charles S. Eidlitz for the Electrical Contractors' Association, and by John P. McMahon, President, and Lester C. Hamlin, Secretary, for Local No. 3, N. B. E. W. of A.

LOCAL UNION NO. 8, CHICAGO.

Special Correspondence, Jan. 18.

Construction work is almost at a standstill in this city at present, owing to the prolonged cold weather.

The Westinghouse Company and the World's Fair Construction Company are working a small force at the Fair buildings.

There will be over 100,000 incandescent lights in the buildings.

The Cornish, The McFell, the Orne and the Edison Electric Companies do nearly all of the construction work in this city.

The Edison Company has been riding a high horse since it won the lamp patent suit, and has started to close all rival lamp factories. Incidentally the price of lamps has been raised over 100 per cent.

Here is where the workingmen suffer. The large companies combine and form a trust, and freeze out the smaller concerns. The next move is to raise the price on all supplies and material. Then the construction men must either raise their prices for work or lower the wages of the men employed, and they generally take the latter course.

No. 9 is now in splendid condition. The new officers are able and energetic, and are determined to make No. 9 the banner Local of the Brotherhood.

S. T. B.

LOCAL UNION NO. 11, OF TERRE HAUTE, IND.

January 10, 1893.

Special Correspondence.

Meeting called to order by President McDonald. Minutes of last meeting read and approved. Treasurer Schaffer's report for the year ending December 27th referred to trustees. Bro. W. C. Bledsoe made a report of the receipts and expenses of the ball, and turned over the net profits, which were considerable, to the sick fund. Communications

from Bro. J. T. Kelly read and placed on file. Committee appointed to wait on the Electric Light and Power Company in regard to wages, reported that they would receive an answer as soon as possible. Badge committee reported that badges would be on hand by next meeting night. The installation of officers was postponed till next meeting. Bro. R. W. Moore was appointed by the president to read an electrical paper at the next meeting. Bro. H. Bledsoe was awarded a handsome emblematic pin of the Brotherhood for selling the greatest number of tickets for the ball. Bro. Mike Murry, who was on the sick list, was declared off and returned to work last week. Brethren of our Local unite with me in wishing THE ELECTRICAL WORKER a great success.

Fraternally,

W. H. SCHAFER, Press Sec'y.

LOCAL UNION NO. 12, OF EVANSVILLE, IND.

January 10, 1893.

Special Correspondence.

No. 12 is moving right along with the tide without making special effort in any direction. With the mercury hiding in the bottom of the thermometer, and business naturally dull at this season of the year, there is little for the boys to do but to amuse themselves.

At the regular meeting held January 3d, the officers for the ensuing year were installed. They are as follows: R. Wright, President; J. Erwin, Vice-President; Harry Fisher, Recording Secretary; S. E. Wilke, Financial Secretary; E. L. Masters, Treasurer; Wm. Marrier, Inspector; Al. Grant, Foreman. This is Bro. Wright's second term as President of No. 12. He was also President of the old Wiremen and Linemen's Union. Bro. Harry Fisher was the Evansville delegate to the St. Louis convention when the National Brotherhood of Electrical Workers was organized, and has since served his union in various capacities and has proven himself to be a hard conscientious worker. Bro. Masters, who has been re-elected custodian of the funds of the union, was our delegate to the Chicago convention and distinguished himself in a gathering where ablest men of the Brotherhood met.

The committee on entertainment made a lengthy report, and from present indications the members of No. 12 and their friends will in the near future have a chance to trip the light fantastic to their hearts' content.

Bro. Bennett and Bro. Brown were reported as being able to go to work, after being laid up for repairs for some time.

W. H. ERNST, Press Sec'y.

DETROIT, MICH.

Local Union No. 17, of this city, appears to be awakening from a lethargic sleep to a full realization of the duties devolving upon it. For some time past its progress has been hampered by a number of drones, whose sole acts were such as calculated to engender strife and discord in our ranks, and whose memory appeared to have been very treacherous when the matter of the payment of dues came up. It became apparent that such ornaments must be got rid of, and that a few others, whose actions towards the Union during the September trouble here warranted their unceremonious expulsion, must also go, and though the number materially decreased our membership, still we adopted heroic measures, and their names are no longer on our membership roll. Already we see the wisdom of our actions, as our present membership is composed of good and true brethren, whose integrity and good will can be counted on at all times.

Recently Bro. S. K. King made a trip to Kalamazoo and initiated five new members, as well as collecting several months' dues from members who were working there.

Our first grand ball took place at Arbeiter Hall Christmas Eve, and, although the elements were

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decidedly unfavorable, about 350 couples were in attendance, and a very enjoyable time was had. A number of elegant prizes (donated by our business men) were awarded for waltzing. Net receipts about \$40. Great credit is due to the committee of arrangements for their untiring efforts in the matter. They are Bros. King, Lyons, Stuart, Byrne, Miller, Klein, Horne, Elliott, Lane, McGuire, Ellsworth and Shuttleworth. All attended strictly to the duties assigned them, and success crowned their efforts.

On December 22d our new staff of officers were elected as follows: President, William C. Stuart; Vice-President, S. Kennard King; Recording Secretary, Isaac B. Miller; Financial Secretary, Ed J. Lane; Foreman, Robert Elliott; Inspector, Dan Ellsworth; Treasurer, Andrew P. Byrne; Trustee, William E. Dawson; Press Secretary, T. Shuttleworth; Delegates to Trades Council, T. Shuttleworth, S. K. King and F. A. Klein.

President Stuart is well fitted for this important office. His six feet of stature and 200 pounds of avoirdupois do not render his figure as large as his intellect, and his genial manner and open-heartedness make him a general favorite among the members, as his sweeping majority over about half a dozen nominees shows.

Vice-President King is an indefatigable worker in the cause, and has been instrumental in inducing several new members to come in. He will not, however, undertake any important undertaking on Friday, as he attributes half a dozen shipwrecks to that ill-fated day, while sailing on the ocean.

Recording Secretary Miller has little to say, but always attends strictly to duty. His eye is ever open to advance the interests of the Order.

Financial Secretary Lane, though of rather diminutive stature, is a "hustler." He has been in nearly every country of the old world during his four years' service in our navy.

Foreman Elliott, or "Scotty," as he is familiarly called, is of genial manners and always ready to "crack a joke," though his motto is "business before pleasure."

Inspector Ellsworth is a sly-going fellow, chock full of zeal for our beloved Order, and does as much to advance unionist interests as any of the brethren.

Treasurer Byrne is a universal favorite among the ladies as well as his brethren, who have re-elected him as custodian of their funds. He firmly believes in conducting business according to Hoyle and any brother who is derelict in his duties is sure of a "calling down" from our handsome treasurer.

Trustee Dawson, like our Recording Secretary, is rather silent, though his weather eye is ever open for anything calculated to benefit the N. B. of E. W., and L. U. No. 17 in particular. He is the vocalist of our party, though but few of the boys have yet had the pleasure of hearing his rich bass voice raised in melody.

J. T. Kinchular, another trustee, is a faithful and conscientious worker both for the D. E. L. & P. Co. as well as for the Union, and will not permit of any unfair means being employed, preferring rather to have all our doings open and above board.

Trustee, Delegate and Press Secretary Shuttleworth is an ex-journalist. Well, the boys all say he is a kicker from away back.

Delegate Klein is well known in the Trades Council, to which he has been re-elected. His loquacity and abbreviated stature, combined with his generosity, render him a prominent figure in all our gatherings. He served an apprenticeship in our army, and was honorably discharged some years ago.

The City Council has received bids for the city lighting from the Detroit Electric Light and Power Co., the Peninsular, and a new company headed by Electrician Fisher, for a term commencing July 1st next. Mayor Pingree, however, is of the opinion that the city should own and operate its own plant, and believes many thousands of dollars could be saved to the city each year by doing so.

REX.

LOCAL UNION No. 18, KANSAS CITY.

January 9th, 1893.

Local Union No. 18 was organized March 16th, 1892. There has been 125 admitted to the Union. But nine have been suspended for non-payment of dues. We have had a number of accidents and have paid out about \$175.00 in benefits. We have an attendance of about 35 at each meeting. Meetings are held in Industrial Hall, S. W. corner 11th and Main streets, fourth floor, every Friday night. Visiting brothers always welcome.

A. G. KNOWLTON, Press Sec.,
609 E. Mo. Ave.

LOCAL UNION No. 26, OF WASHINGTON, D. C.

The regular meeting of No. 26 was called to order by President Deffer, Friday evening, January 6th, assisted by V. P. Metzel. Roll call of officers showed all present. Delegates to the Federation had nothing to report. The following officers were installed by President Deffer: President, R. F. Metzel; Vice-President, Albert Maw; Recording Secretary, W. W. Gilbert; Financial Secretary, Wallace R. Seavey; Treasurer, H. D. Newman; Inspector, M. S. Beaton; Foreman, Geo. A. Malone; Trustee, Jno. M. Berger; Press Secretary, W. W. Gilbert. A rising vote of thanks was extended to Bro. Deffer for the able and efficient manner in which the officers were installed.

There is a danger which threatens the life of our Union, and must be promptly nipped in the bud. It is wiremen accepting contracts for small jobs which can be done by the wiremen after working hours. Of course, a wireman with true principle of an honest man will not do so, but it is done to an alarming extent in this city. When a contractor pays a wireman the Union scale of wages, the contractor should, in justice, get all the small jobs as well as the large ones. Nine cases out of every ten, the wireman will work for the contractor during the day, and steal enough material from him to do a small job, which will cost the consumer less than one-half of the amount bid by an honest and legal contractor.

If these small jobs were referred to the boss, instead of being privately accepted by the wireman, the wireman would have a better assurance of steady employment, the boss would have more contracts on hand, and both parties would derive a benefit from the Union.

If any members of the Union are caught doing work on their own private contracts, they should be expelled from the Union on the charge of being contractors and undermining the wages of an honest member. Non-union wiremen should be promptly reported to their employees. This may seem to some like an unprincipled action, but it is the only way to do, that we may deal on the fair and by the square, so that the principles of justice may fit to an exact nicety.

Fraternally yours,
W. W. GILBERT.

LOCAL UNION No. 27, OF BALTIMORE, MD.

January 7, 1893.

Special Correspondence.

Trade in the monumental city is holding its own so far this winter, and the chances are that the members of No. 27 will have steady work all winter.

At our last meeting we had a lively time. Several applications were received and some new lights were added to our circuit. The proposed amendments to our constitution submitted by the recent convention were unanimously adopted. The committee on amusement reported arrangements about completed for our annual ball. It was decided to hold weekly instead of semi-monthly meetings in the future.

S. R. WILCOX, Press Sec'y.

LOCAL UNION No. 28 OF PHILADELPHIA.

At the regular meeting held on Tuesday evening, December 20th, the following officers were elected

for the coming term: President, J. W. Fitzpatrick; Vice-President, J. A. Freney; Recording Secretary, H. B. Frazier; Financial Secretary, T. G. Flynn; Press Secretary, T. Dillon; Treasurer, J. Grant; Trustees, J. Willie, P. Grant, P. King.

Grand President, Henry Miller, was present, being in attendance at the convention of the Federation of Labor in this city. He made a short, fluent speech, in which he referred to the wonderful progress of the Brotherhood all over the country, and congratulated Local No. 28 for the great increase in its membership.

The chairman of the ball committee made such a glowing report that there is no doubt that the electrical ball will be one of the grandest of the season.

Owing to considerable time being taken up in the election of officers, the proposed amendments to the constitution were laid over until the next meeting. There were 17 new members initiated.

JOHN A. FRENEY,
1120 Ridge Ave., Philadelphia.

LOCAL UNION No. 34, OF BROOKLYN.

January 8, 1893.

A happy and prosperous New Year to the Electrical Workers' Journal.

J. T. KELLY, Esq., Editor:

It gives me great pleasure in writing for the journal, although hardly knowing what to say. Writing for a journal is somewhat new to me, never having had the opportunity before but will say for the benefit of our many readers, that Local No. 34, of Brooklyn, is progressing very nicely and the boys are determined to make the same a model organization, not in numbers, but in spirit. We are very enthusiastic and expect to do great things in the near future.

We held an election for officers last week and I was very much surprised that our worthy past President, Bro. Simpson, was not re-elected.

However, our newly elected President, Bro. Holihaw, may prove himself worthy of the honor conferred upon him.

I will say right here in my opinion that a six months' term in office is hardly long enough, for this reason: It takes almost that length of time to become thoroughly acquainted with the duties required; and just as things begin to go smoothly at meetings, then the officer, if not re-elected, will have to give way to his successor, who will have to start from the beginning again.

I would like to hear from other Locals on this subject, and have them express their opinions on the subject; though this journal, and I believe a majority will coincide with me, that a year at least is short enough time for the Presidents, Secretaries and Treasurers to hold.

Another thing I would like to say: that there are as yet a great number of men who do not belong to our Order. Now suppose we all constitute ourselves a committee of one and interview these men, wherever they are, and point out to them where it will benefit them, and that when once we are united all over the country, we will be one of the strongest Orders in existence, and next to impossible for us to fail in any of our attempts to better ourselves.

United we stand, but divided we will not fall.

Hoping that at the next issue of the journal I will be able to contribute more, I remain

Fraternally yours,

LOUIS W. DILLMAN,
Press Secretary No. 34.

FIVE THOUSAND copies of this issue of the ELECTRICAL WORKER are now in the hands of those interested in electricity, and will be read by at least 15,000 people. Send for advertising rates and place your advertisement where it will do the most good.

DIRECTORY OF LOCAL UNIONS.



(Secretaries will please furnish the necessary information to make this directory complete. Note that the time and place of meeting, the name of the President, the names and address of the Recording and Financial Secretary are required.)

No. 1, St. Louis, Mo.—Meets every Tuesday evening at 305½ Olive st. D. Lafferty, President; M. A. Walsh, Recording Secretary, 315 Chestnut st.; John Hisserick, Financial Secretary, 315 Chestnut st.

No. 2, Milwaukee, Wis.—Meets 2nd and 4th Wednesday at 244 N. Water st. W. Denning, President; F. W. Smith, Recording Secretary, 377 Fifth st.; W. Tolbert, Financial Secretary, care of 377 Fifth street.

No. 3, New York, N. Y.—Meets weekly at Clarendon Hall, 114 E. Thirteenth st. John P. McMahon, President; Lester C. Hamlin, Recording Secretary, 642 E. Nineteenth street; E. D. Leaycraft, 283 Flatbush ave, Brooklyn, N. Y.

No. 4, New Orleans, La.—Meets 2nd and 4th Wednesday at Odd Fellows' Hall. Wm. Moake, President; J. C. Brodley, Recording Secretary, Napoleon and Custom House sts.; J. J. Vives, 173 S. Basin st.

No. 5, Nashville, Tenn.—A. H. Praugue, President; J. C. Bender, Recording Secretary, 817 N. Market st.; E. W. Morrison, Financial Secretary, 73 Durham st.

No. 6, Memphis, Tenn.—(No report from new officers.)

No. 7, Springfield, Mass.—W. J. Condon, President, American Hotel; J. F. Hoyt, Recording Secretary, American Hotel; F. Hyatt, Financial Secretary, American Hotel.

No. 8, Toledo, O.—Meets every 2nd and 4th Thursday at Mulcahy's Hall, cor. Monroe and Erie sts. James Carney, President; Michael Connors, Recording Secretary, 213 Everett st.; T. H. Nevitt, Financial Secretary, 1007 Bartlett st.

No. 9, Chicago, Ill.—Meets every Saturday at Plasterers' Hall, 192 E. Washington st. G. W. Edison, President; Gus Sauers, Recording Secretary, 105 Dearborn ave.; J. Capps, Financial Secretary, 337 Michigan ave.

No. 10, Indianapolis, Ind.—Meets every other Monday at 33½ S. Illinois st. Sam'l B. French, President; L. E. Jones, Recording Secretary, 95 N. Meridian st.; C. W. Neal, Financial Secretary, 199 W. Maryland st.

No. 11, Terre Haute, Ind.—Meets every 2nd and 4th Tuesday at Washington Hall, cor. Eighth and Main sts. John Davis, President; Harry Bledsoe, Recording Secretary; Wm. C. Bledsoe, Financial Secretary, 424 S. Thirteenth st.

No. 12, Evansville, Ind.—Meets every Tuesday evening at Hahn's Hall, High st. R. Wright, President; Harry Fisher, Recording Secretary, 202 Clark st.; L. E. Wilke, Financial Secretary, box 266.

No. 13, Cincinnati, O.—Meets every Monday at Germania Hall, Vine st. A. J. Eich, President; T. W. Sullivan, Recording Secretary, Price ave., Price Hill; C. S. Kuntz, Financial Secretary, 64 Carlisle ave.

No. 14, Bridgeport, Conn.—E. S. Marsh, President, 173 Fairfield ave.; Ed Fagan, Jr., Recording Secretary, 78 Gregory st.; Gus E. Ruther, Financial Secretary, 67 Madison ave.

No. 15, Worcester, Mass.—Chas. Cumming, Recording Secretary, 393 Main st.

No. 16, Cleveland, O.—Meets every Friday at Halle Bro. Hall, 356 Ontario st. Geo. E. Donald, President; M. McElligotte, Recording Secretary, 191 Hohenden ave.; Hugh Murrin, Financial Secretary, 907 Wilson ave.

No. 17, Detroit, Mich.—Meets every Monday at Hoffman's Hall, cor. Congress and Randolph sts. W. C. Shuart, President; I. B. Miller, Recording Secretary, 71 Henry st.; E. J. Lane, Financial Secretary, 190 Humboldt ave.

No. 18, Kansas City, Mo.—Meets every Friday at Forester Hall, sw. cor. Eleventh and Main sts. J. J. Jones, President; C. H. Adams, Recording Secretary, 215 W. Fourteenth st.; J. C. Haupt, Financial Secretary, M. & K. Tele. Co., Sixth and Delaware sts.

No. 19, Pittsburg, Pa.—H. Hart, President; W. J. Condon, 4 Mansion st.

No. 20, New Haven, Conn.—Wm. Welch, President; Thos. Brennan, Recording Secretary, 90 Carsile st.

No. 21, Wheeling, W. Va.—J. Allen, President, 36 Thirteenth st.; H. T. Wyse, Recording Secretary, Hotel Wilhelm; J. T. Bonnett, Financial Secretary, 2623 Jacob st.

No. 22, Omaha, Neb.—Meets at Arcanum Hall, 1314 Douglas st. E. L. Stringer, President; 3419 Burt st.; F. B. Sabin, Recording Secretary, Neb. Tel. Co.; M. J. Cowgill, Financial Secretary, 1915 Farnam st.

No. 23, St. Paul, Minn.—Joe Macauley, President; Robert Knowlton, Recording Secretary, Capital Bld., room 25; Chas. Carey, Financial Secretary, 311 E. Thirteenth st.

No. 24, Minneapolis, Minn.—P. J. Fleming, President; E. Christman, Recording Secretary, 574 Sixth ave. north; R. V. Sheldon, Financial Secretary, 1718 Wash ave. N.

No. 25, Duluth, Minn.—S. J. Kennedy, President; Phil Bellivere, Recording Secretary, Wieland Bld.; Thos. Bradley, Financial Secretary, 318 E. Third st.

No. 26, Washington, D. C.—Meets every Friday at —. R. F. Metzel, President, 509 Eleventh st. Nw.; W. W. Gilbert, Recording Secretary, 941 Maryland ave. Sw.; W. R. Seavey, Financial Secretary, 1110 Kst. Ne.

No. 27, Baltimore, Md.—Meets —. Fred Russell, President, 1408 Asquith st.; Wm. Manning, Recording Secretary, 1026 N. Front st.; J. W. Ebaugh, Financial Secretary, 107 N. Gay st.

No. 28, Philadelphia, Pa.—Meets —. J. W. Fitzpatrick, President; H. B. Frazer, Recording Secretary, 1425 Vine st.; Thos. Flynn, Financial Secretary, 1116 Jackson st.

No. 29, Wilmington, Del.—M. H. Hanigan, President; Elwood A. Tazewell, Financial Secretary, 609 French st.

No. 30, Trenton, N. J.—Wm. Walton, President; Ed. G. Sarides, Recording Secretary; Thos. Connry, Financial Secretary.

No. 31, Jersey City, N. J.—Thos. Watson, President; Wm. Dooley, Recording Secretary, 417 W. Side ave.; John Speicher, Financial Secretary, 105 Newark ave.

No. 32, Paterson, N. J.—E. J. Clancey, President; Frank Areson, Recording Secretary, 214 Godwin st.; T. M. McAndrews, Financial Secretary, 64 Railroad ave.

No. 33, Newark, N. J.—Henry R. Beckmeyer, President; J. B. Gove, Recording Secretary, 30 Columbia st.; John Stiff, Financial Secretary, 38 Elm st.

No. 34, Brooklyn, N. Y.—T. J. Holihan, President; R. White, Recording Secretary; L. W. Dillman, Financial Secretary, Pt. Richmond sta.

No. 35, Boston, Mass.—Wm. M. Lannan, President; T. M. Gimes, Recording Secretary, 897 Washington st.; T. R. Melville, Financial Secretary, 95 Pearl st., Charlestown, Mass.

No. 36, New York N. Y.—J. E. McGinty, President; L. L. Hall, Recording Secretary, 117 Leonard st.; John J. McDounell, Financial Secretary, 1632 Madison ave.

No. 37, Hartford, Conn.—Morris Cavanagh, President; Chas. Wilund, Recording Secretary, 146 Main st.; Geo. Dugan, Financial Secretary, Elec. Light & Power Co.

No. 38, Albany, N. Y.—Meets the 1st and 3rd Thursday of each month. W. McNamara, President; John M. Wiltse, Recording Secretary, 22 Third st. E. Albany; Owen Dooney, Financial Secretary, 4 Rensselaer st., Troy.

No. 39, Grand Rapids, Mich.—J. R. Watson, President; L. L. Henry, Recording Secretary, 97 Ottawa st.; Geo. Dierdorf, Financial Secretary, 723 Fifth ave.

No. 40, St. Joseph, Mo.—Meets every Saturday at Weidmeier & Wildburger's Hall, 623 Messanie st.; M. L. Durkin, President; Martin Keran, Recording Secretary, 220 N. Thirteenth st.; Wm. Dorsel, Financial Secretary, 1708 Calhoun st.

No. 41, Chicago, Ill.—Meets every Wednesday at 116 Fifth ave. C. J. Edstrands, President; Chas. Osberg, Recording Secretary, 234 Townsend st.; Wm. Meecham, Financial Secretary, Crawford, Cook Co.

No. 42, Utica, N. Y.—W. B. McCoy, President; C. F. Allen, Recording Secretary, 7 Spring st.; G. P. Owens, Financial Secretary, cor. Perkins ave. and Jewett st.

No. 43, Syracuse, N. Y.—Jas. Tyrell, President; A. D. Donovan, Recording Secretary, 305 Temple st.; Chas. Beattie, Financial Secretary, 217 N. Crouse ave.

No. 44, Rochester, N. Y.—John Cox, President; H. W. Sherman, Recording Secretary, 47 Glenwood Park; M. Galitzdorfer, Financial Secretary.

No. 45, Buffalo, N. Y.—E. Calvin, President; F. Hopkins, Recording Secretary, 77 Swan st.; T. V. Thompson, Financial Secretary, 139 N. Division st.

GENERAL NEWS.

Where Electrical Workers May Look for Work.

Brooklyn, N. Y.—The Coney Island & Brooklyn Railroad Co., will increase its capital to \$1,000,000 and change its equipment to an electric system.

Washington, D. C.—The Glen Echo Railway extends its lines.

Waverly, N. Y.—The Athens, Waverly and Layre Electric Railway Co. will build a road connecting the three towns.

Rochester, N. Y.—The Citizens' Light & Power Co. have commenced work on its new power plant on Brown's race. The plant will be ready for operation about April 1st.

McMinnville, Tenn.—The Tennessee Woolen Mills intend to put in an incandescent electric light plant.

Greene, N. Y.—The Greene Electric Light Co. has been awarded the contract to light the streets with incandescent lamps.

Omaha, Neb.—The Omaha Packing Co. will put in a 400-light incandescent plant.

St. Louis, Mo.—Contracts are let for the Clayton and Forest Park Electric road. It will be about 6 miles long.

Vicksburg, Miss.—The Vicksburg Electric Transit & Light Co. propose building about 5 miles of road.

Jamestown, N. Y.—A \$15,000 addition will be made to the city electric light plant to provide for the new lights required to light the city.

Boston, Mass.—Deer Island, one of the city institutions, contemplates putting in an electric light plant.

San Francisco, Cal.—The Consolidated Piedmont Cable Co. propose to substitute electric power on its line to the Mountain View Cemetery.

Buffalo, N. Y.—The proposed electric road between this city and Niagara Falls, will probably be started before long.

St. Charles, Ill.—The Municipal Plant proposes to put in a 1000-light alternating dynamo.

Little Rock, Ark.—The Edison Co. will add two new dynamos to their plant. The Municipal Arc Light plant will also be increased and changed from a low to a high-tension system.

Beatrice, Neb.—The Beatrice Rapid Transit & Power Co. is rebuilding its station, recently burned.

Indianapolis, Ind.—The Indianapolis Light & Power Co.'s new plant will be in operation about Mar. 1st. They also propose to put in a large incandescent plant.

Philadelphia, Pa.—The Columbia Electric Light Co. will increase its plant.

JAN 1893

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TAKE NOTICE.

Officers of Local Unions should carefully read the following rules before writing for information:

1. Give notice at once when a change occurs in Secretary's address, or when a vacancy has been filled by the election of a new officer.
2. Consult the financial report in the WORKER every month, and if incorrect, report at once.
3. Arrange to receive any mail that may be en route to old addresses of officers, when change occurs.
4. In reporting the election of new officers, use the regular blank furnished for that purpose, and write plainly the name and address of each officer.
5. The monthly report of the financial secretary must accompany the dues sent.
6. Never fill out a report of any kind until first making it out on waste paper, then copy it on the regular report blank. This obviates alterations and scratching.
7. Always put name and address on reports and letters.
8. Send in name, number of card, age, and date of admission of each new member, as he will not be entitled to benefits until his name is enrolled on the books at the general office.
9. Report promptly the suspension or expulsion of members; also traveling cards taken out.
10. When sending money always state what the amount is for; do not leave it for the G.S.-T. to guess at.
11. All orders for supplies should be accompanied with the requisite amount of money.
12. Never send money in a letter. All remittances should be forwarded by post-office money order, express money order or bank draft.
13. Unions indebted for over two months' dues are non-beneficial (see Art. XV, Sec. 5). All members are interested in this matter and should look after it closely.
14. On the expiration of a traveling card the member holding said card should pay one month's dues and receive a duecard and be enrolled as a member of the Union, the same as a new member.
15. All Local Treasurers should be under bond and the same filed with the G. S.-T.
16. All receipts and correspondence from the general office should be read at the meetings.
17. Read the constitution carefully and consult it on all matters that arise for consideration.
18. Make out all reports with ink and use the regular report blanks and letter paper furnished for that purpose.
19. When admitting or reinstating members the strictest inquiry as to health must be observed. If the member is married the wife's health must also be noted.

20. Claims for benefit must be filled out in every particular, and the law in regard to their presentation rigidly complied with.
22. No claims will be allowed unless the member is square on the books. Our beneficial system would cease to be an incentive for prompt payment of dues were this law not enforced.
22. Remittance of dues is not allowed under our Constitution. The amount of the dues must be deducted from the sick benefit paid by the Local. A member entitled to benefits can not get in arrears while receiving benefit. Members, by contribution, can keep the dues of a sick or unfortunate brother, not entitled to benefits, paid up.
23. Salaried officers must pay their dues and carry due cards. When salaries are due they must present their bill, and its payment passed on the same as any other bill presented to the Union.
24. Newly-elected officers must procure all blanks, documents, etc., from their predecessors.
25. Unions should never assume to pay the funeral expenses of deceased members until first assured that the claim is allowable.
26. Preserve old due cards. They may be useful for reference in case of dispute over dues, etc.
27. Members should always when attending meetings of the Union have with them their Constitution and By-Laws; also their due card.
28. Parties making statements in reference to recreant members will be held responsible for statements sent in for publication.
29. Matter for the ELECTRICAL WORKER must reach the general office by the 10th of each month.

As we are about to open a new roll book we request all Secretaries to furnish us soon as possible a complete roll of their members since their Union was organized. Some of the Unions with a membership of 100 to 200, according to the Financial Secretary's report, have less than twenty entered on the books at the general office, and none outside of those twenty would be entitled to death benefits.

Send in the name of every member initiated since the Union was organized, even though long since suspended or expelled. This is necessary, as we must have a correct record of every member who ever belonged to the Brotherhood.

There has probably never been any invention that the electrical world can boast of so loudly, or that is such a wonder to the entire thinking world as the search light. "It might seem ridiculous to those who do not understand it when you tell them that the candle power of a couple of the ordinary search lights goes up into the millions, and in some cases the tens of millions. Yet this statement is fully borne out by the facts. Of course, the lamp does not give such an enormous candle power when it is measured in itself. But take the search light as it is used with the great magnificent lens, which contracts all the light and throws it in a single direction, and the intensity of the light is so great that it is quite impossible to compute it. For instance, the candle power of the big search light to be used at the World's Fair is 150,000 alone, the carbons are to be 12 inches long and 1 3-16 inches in diameter. When this is surrounded by that reflector, 4 feet in diameter, the candle power at once mounts up to 460,000 candles.

INVENTOR P. KENNEDY's new storage-battery motor proved to be a success in a most difficult street railway test in New York recently, making twenty miles an hour at a cost of nine cents a car per mile.

The columns of the ELECTRICAL WORKER are always open for the discussion of any question in which the interest of the electrical workers or the electrical industry are at stake.

RECORD OF ELECTRICAL PATENTS FROM JAN. 1ST TO DATE

- 489,464, J. H. Crosby, electro-steam valve attachment.
489,431, Ernest H. Jenkins, electric railway trolley.
489,505, W. L. Silver, journal bearing for dynamos.
489,519, M. O. Anthony, automatic coin actuated feed and return mechanism for phonographs.
489,522, W. C. Cahall, galvanic battery.
489,526, H. M. Doubleday, electric lighting system.
489,551, C. N. Waite, electrical diaphragm for electrolytic cells.
489,553, G. Baehr, electrical switch.
489,559, G. L. Foote, galvanic battery.
489,563, D. E. Kimball, electric railway.
489,570, -489,571, C. E. Scribner, spring jack switches.
489,573, G. W. Von Siemens, conductor system for electric railways.
489,597, F. B. Badt, multiphase electric system.
489,598, F. B. Badt, electric lighting for electric street railways.
489,603, J. L. Davidson, attachment for telephones.
489,616, A. M. Sloss, electric gas light apparatus.
489,625, S. G. Brinkman, electrically controlled ventilator.
489,629, W. F. Z. Desant, railway signal.
486,666, E. L. Wilson, sound recording instrument.
489,638, L. McCarthy, strain insulator.
489,638, C. H. Bryan, electric battery.
489,677, J. Greenwood, production of chlorine and caustic soda.
489,687, Ott & Kennelly, controlling electric motors.
489,709, Carl Hering, variable speed electric motor.
489,736, J. F. Geary, railway signal.
489,739, L. H. & L. N. Dalysson, socket switch for incandescent lamp.
489,764, Sheldon, Murnane & Van Beek, underground electric railway.
489,832, W. R. Rend, galvanic battery.
489,835, C. A. Stark, closed conduit electric railway.
489,861, G. H. Bennett, blanket for electric light wires.
489,902, W. S. Hull, electric prison cell and guard.
489,913, F. J. Agabeg, fan.
489,916, A. Baker, apparatus for preserving foods.
489,938, J. H. Davis, electric battery.
489,944, A. C. Goetz, electric railway switch.
489,983, W. B. Potter, electric cut-off.
489,990, C. E. Scribner, telephone.
490,011, F. J. Dibble, electric motor.
490,012, F. J. Dibble, electric telemeter transmitter.
490,013, F. J. Dibble, electric telemeter transmitter.
490,014, F. J. Dibble, telemeter system.
490,034, T. E. Morford, electric heater.
460,064, F. H. Brown, telegraphy and telephony.
490,081, J. F. McLaughlin, commutator brush and holder.
490,072, J. F. McLaughlin, electric heater.
490,061, J. A. Nadeau, electric alarm lock.
490,178, Elihu Thompson, electric circuit breaker.
490,183, C. O. C. Billberg, a commutator brush.
490,202, G. E. Hunter, testing watch balances and hair springs.
490,203, G. E. Hunter, method of testing watch balances and hair springs.
490,231, N. M. Powell, electric battery.
490,256, G. R. Meitzler, electrically heated soldering iron.

ELECTRICAL PATENTS EXPIRING JAN. 11, 1893.

- 172,218, automatic electric fire alarm, W. B. Watkins; 172,219, 172,220 and 172,221, fire alarm telegraphs, W. B. Watkins.
171,998, L. S. Crandall, telegraph key.

The Edison Co. of St. Louis, must mean business. It recently increased its capital stock from \$5,000 to \$3,500,000. If it were not for the fact that it paid the Secretary of State \$1,750 for the increase, it would look like another bluff of the General Electric Co.

TRADE NOTES.

Shultz Belting Co., of St. Louis and the rest of the earth, are now busy manufacturing an eighty-inch belt, which when completed will be the largest in the world. The statistical fiend has worked out the problem and avers that the Shultz Belting Co. have actually, during their long business career, manufactured enough belting to connect the earth and moon, so that their trade-mark is something more than a myth.

The Laclede Power Co. report the sale of some large C. & C. motors. C. & C. motors furnished by this company are now doing all kinds of work in this city, such as running printing presses, elevators, etc.

Western Electric Supply Co. report a splendid past year's trade, and the increase in space and doubling of forces, and the continuous incoming and outgoing of immense quantities of supplies of all kinds, show an ever increasing volume of business. Anything manufactured for the electrical trade can be found at the Western Supply Co.'s place at 619 Locust street.

The Municipal Electric Light & Power Co., with the largest central station in the world, thoroughly equipped with the most approved arc and incandescent machine, can always be relied on to furnish their patrons with the best light in the market.

Van Nort Bros. have just opened up large quarters at 718 Market street, and are rushed with work, both in the construction and supply departments.

Acme Oil Filter, 730 N. Main.—Over 500 sold in less than eighteen months makes a very good showing. Under the able management of Mr. Flower the 1000 mark is plainly visible in the near future. His liberal offer to send one on a thirty days' trial shows his faith in the superiority of the Acme Oil Filter. Send for a catalogue.

Home Novelty Co. of Tenth and Walnut have an electrical curiosity shop; an underground electric road, a horizontal arc light and an entirely new electric pen are a few of the electrical novelties manufactured by the Home Novelty Co.

Interstate Complete Electric Construction Co., occupying Heisler's old factory, 809-817 S. Seventh street, are very busy filling town and country orders, and are fully equipped to estimate and complete large or small contracts.

A. M. Morse & Co. of 520 Olive have an extensive experience in designing and building power plants for electric light stations, electric railways and various manufacturing establishments, and have built many of the central lighting and power stations in prominent cities of Missouri, Illinois, Kansas and Texas. They can also refer to many isolated plants in St. Louis and Kansas City. They solicit correspondence and will mail catalogue and complete lists of the Buckeye engine on application.

Rose Electric Light Supply Co., 1106 Pine, carry an immense stock of new and second-hand supplies of all kinds, and have had a very busy year, with good prospects of doubling their business this year. Send for their catalogue.

Crandall Packing Co., 520 N. Third have only lately introduced their patent packing to the Western public, but can already refer to some of the largest plants in and out of town. Send for descriptive catalogue and sample.

Werner Engraving Co., 24 and 26 S. Third, are wood, photographic and half-tone engravers, and several specimens of their work can be found on other pages of this paper.

Fred Dresel, 301 Market, general engraver and die-sinker, is closing up last year's business with a comfortable balance at his banker's. He is one of the pioneers of his trade in this city.

W. H. Haskell, 713 Olive, engraver and jeweler, is a specialist in the manufacture of emblematic buttons, pins, charms and badges, and has probably furnished more original designs for the use of secret societies, lodges, unions, etc., than any other man in the West.

E. Spangenberg, 314 N. Third, has a very successful engineering school, which is open daily from 9 A. M. to 10 P. M., excepting Sunday nights. His classes are well filled and his pupils are practical engineers when through their course, and find no trouble in getting situations as such.

H. Remmers & Son, 1108 and 1110 St. Charles, are pioneer pattern and model-makers, and do most of the work for all the large electrical supply houses. They are also specialists in making models for new inventions.

Higdon, Higdon & Longan, patent lawyers, report a large increase of electrical patents and claim the wild and woolly Westerners are outdoing the effete Easterners in valuable inventions.

Hurst Air-Space Covering Co., 719 N. Main, have a new thing and a good thing, which they are successfully introducing to the trade.

Knight Bros., Se. Cor. Broadway and Olive, are very successful patent lawyers, and have secured many valuable patents and trademarks for their customers. They report that electrical patents are booming.

Stagl Electric Engineering Co. have done a larger business than ever during the past year. They recently finished the electrical work on the palatial residence of Adolphus Bush, and are now wiring the new Columbia Building. They have contracts enough on hand to keep a large force of men busy for some time.

We are indebted to R. F. Harding, patent lawyer, of Washington, D. C., for our very complete list of electrical patents, which most of our readers will doubtless peruse with profit to themselves.

Fowler & Fowler, patent lawyers, are handling some very fine electrical patents, some of which will surprise electricians, and will net thousands of dollars to the inventors.

To those interested in electricity: Subscribe to the ELECTRICAL WORKER—one dollar per year in advance.

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ELECTRICAL

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OFFICIAL JOURNAL OF THE

National Brotherhood of Electrical Workers.

The only electrical paper published in St. Louis. Contains the latest news of patents granted or run out, new plants and corporations, with original articles and latest items of interest to all persons interested in electricity.

ONE DOLLAR PER YEAR IN ADVANCE.

THE ELECTRICAL WORKER,

904 Olive Street, St. Louis, Mo.

JAN 1893

ADVERTISE IN THE **Electrical Worker**

The official organ of the National Brotherhood of Electrical Workers. It goes direct to the men that do the work and recommend or order the supplies.

The Electrical Worker,

904 OLIVE STREET, —ST. LOUIS, MO.

Electric Hand Lamps.

The manufacture of electric hand lamps must now be numbered among modern electrical industries. Many improvements have been lately made in the construction of these portable and convenient lights. A small storage battery is used, the active material of which is lithanode, a substance which is likely to be largely used for such purposes. Electric hand lamps are not only used by travelers for reading in railway cars, but they are employed for medical, dental and photographic purposes, as an illuminant in gunpowder mills and stores, in coal mines, petroleum ships and stores, in gas and chemical works and anywhere that the use of a good and perfectly safe light is absolutely necessary. One special form is made with a five-cell battery, and is much in request by lecturers, photographers and others who desire to project the light on a paper or other object and at the same time to shield their own eyes. Another form is a special "pocket" battery of the two-cell type. This handy little lamp will give a good light for a period of four hours with one charge, and is so light and compact that it will go comfortably into the coat pocket, and can be turned on at a moment's notice. These lamps, made in various grades of strength, according to the purposes for which they are intended, are now being used by policemen and tram-car conductors and for many other purposes in which a portable lamp is necessary.

Electric train-lighting apparatus is being introduced on the Northern Railway of France, six, eight or ten candle-power lamps being used according to the class of the compartments. Each car carries its own independent battery of sixteen storage cells inclosed in sets of two in small wooden boxes,

four of which are attached to the longitudinal frames of the car in such a manner as to be readily accessible. Commutators and switches placed outside the car enable all the necessary connections to be made easily. The lamps are supplied with bright, white-enameled reflectors, fitting into the ordinary oil-lamp globes, with covers so arranged that oil lamps may be substituted for the electric lights if desired. A number of these coaches are now running on the express trains between Paris and Lille, and it will be interesting to watch their history and compare their practical working with the system outlined last week, now in use on some of our American railway cars. The French road has been experimenting about two years with these lights already, and a somewhat similar use of storage batteries has been made on one of the Swiss roads for more than a year past.

Horse Power.

The term "horse power," as applied to a boiler, is not an ideal one, by any means. It can be applied to the engine, for the engine does work, and horse power there signifies something definite. But a boiler only produces steam, and how much power that steam can give out will depend upon the engine in which the steam is to be used. For this reason, using the American Society of the Mechanical Engineers' standard of horse power for the boiler (or the evaporation of 34½ pounds of water from and at 212° per horse power), a battery of boilers of 300 horse power would supply steam for 600 horse power in a compound engine, and but 300 horse power in a simple engine. That is why the term horse power, applied to a boiler, signifies so little except the engine is known, too; but, by using the standard, just what the boiler can do is plain enough.—*Boston Journal of Commerce.*

Photographing Lightning.

Many theories have been advanced as to the nature of the actual motion made by the lightning flash, and it has devolved on photography to afford the most valuable testimony yet secured as to the oscillatory character of this form of electricity. Some pictures of exceptional merit in this respect were taken by W. N. Jennings, by camera, from a rapidly moving train on the prairies of North Dakota at midnight in the month of August. The first and second, taken broadside from a car window, showed single and double discharges, and telegraph poles in triple outline. The third, taken from the rear platform of the train, showed a single discharge with buildings in quadruple outline. The fourth showed a wonderful discharge in the form of a broad band, which was called "sash" lightning. All the photographs went to prove that lightning has an oscillatory motion.

An electric phaeton of one ton burden is being constructed at Indianapolis, Ind., for the use of the World's Fair. The vehicle is unique in design and very graceful in outline, and despite its immense weight its adjustment is so perfect that a "child can draw it on a level surface. The phaeton is intended to carry two passengers on the front seat, while the motor man, seated on the "rumble" and guiding the machine with one hand, regulates the power furnished by a battery of three cells secreted beneath the front seat and conveyed to a one-half horse-power motor, which is also "out of sight" under the seat. It is calculated that this electric vehicle will maintain a speed of three miles an hour, and if it proves successful others on a larger scale will be built.—*Carriage Journal.*

FOR SALE.

ARC DYNAMOS.				
5	9 1/4	amp.	35	light, Waterhouse dys. and reg'ltr.
1	9 1/4	"	10	"
2	18	"	65	" Van Depoel " no "
1	18	"	12	" " " "
1	18	"	8	" " " "
1	18	"	6	" " " "
1	9 1/4	"	10	" Excelsior " " "
1	9 1/4	"	8	" " " "
1	9 1/4	"	30	" Brush " with "
1	9 1/4	"	5	" " " no "
1	9 1/4	"	25	" Ball " with "
2	18	"	40	" West'n Ele. " " "
1	18	"	20	" U. S. " " "
2	18	"	30	" Jenney " " "
1	9 1/4	"	16	" " " " "
1	9 1/4	"	20	" American " no "
1	9 1/4	"	50	" " " " "
1	9 1/4	"	40	" Sperry " with "
2	18	"	20	" " " " "

ARC LAMPS.				
200	9 1/4	amp.	single	Waterhouse lamps.
67	9 1/4	"	double	" " "
15	6 1/4	"	single	Brush " No. 16.
69	9 1/4	"	"	" " No. 10.
43	9 1/4	"	"	" " No. 16.
97	18	"	double	Jenney " " "
80	9 1/4	"	Brush	" " No. 11.
50	18	"	single	Jenney " " "
43	18	"	single	Western Ele. " " "
200	18	"	double	Van Depoel " " "
45	18	"	single	" " " "
54	9 1/4	"	Excelsior	" " " "
5	9 1/4	"	double	" " " "
20	9 1/4	"	single	Ball " " "
40	18	"	Sperry	" " " "
35	9 1/4	"	single	American " " "
50	9 1/4	"	double	American " " "

INCANDESCENT, ETC.				
1	2,300	volt	500	light U. S. alternator with conv'trs.
2	110	"	350	" Jenney dynamo " rheostat.
1	80	"	400	" Consolidated " " "
1	96	"	450	" Brush " " "
1	96	"	300	" " " " "
2	4	amp.	300	" Heisler " reg'ltrs.
2	4	"	500	" " rheostat.
1	110	"	300	" Royal " " "
1	9 1/4	"	"	two horse power Baxter.
1	9 1/4	"	"	one-quarter horse power C. & C.

NOTICE.—CUT THIS LIST OUT FOR FUTURE REFERENCE. We do not sell dynamos on commission or option, but buy outright, and all the above apparatus can be seen at our warerooms, St. Louis, Mo. All apparatus overhauled and tested before shipment.

Rose Electric Light Supply Co.

St. Louis, Mo.

Room 232, Electrical Exchange Building, New York.

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A. C. FOWLER, WILLIS FOWLER.
Formerly Examiner Electrical
Division, U. S. Patent Office.

FOWLER & FOWLER,

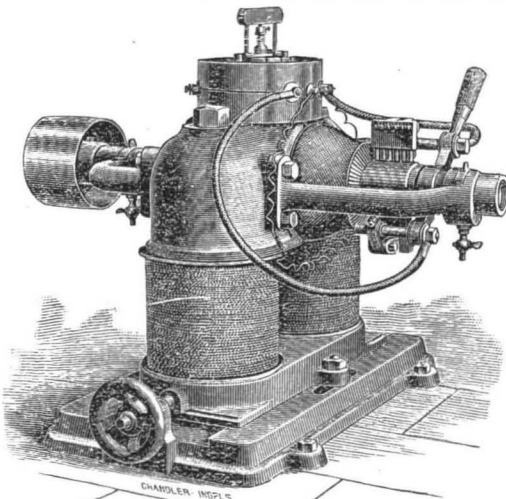
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MOTORS A SPECIALTY.

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N. W. Cor. Third.

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Higdon & Higdon & Longan,

ATTORNEYS-AT-LAW,

Patents obtained and Drawings made
for Complex Electrical Inventions.

ST. LOUIS: Rooms 215-216-217 Odd Fellows Bldg.
WASHINGTON: Room 48, Pacific Building,
Opposite Patent Office.

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18. Make out all reports with ink and use the regular report blanks and letter paper furnished for that purpose.
19. When admitting or reinstating members the strictest inquiry as to health must be observed. If the member is married the wife's health must also be noted.

20. Claims for benefit must be filled out in every particular, and the law in regard to their presentation rigidly complied with.

22. No claims will be allowed unless the member is square on the books. Our beneficial system would cease to be an incentive for prompt payment of dues were this law not enforced.

22. Remittance of dues is not allowed under our Constitution. The amount of the dues must be deducted from the sick benefit paid by the Local. A member entitled to benefits can not get in arrears while receiving benefit. Members, by contribution, can keep the dues of a sick or unfortunate brother, not entitled to benefits, paid up.

23. Salaried officers must pay their dues and carry due cards. When salaries are due they must present their bill, and its payment passed on the same as any other bill presented to the Union.

24. Newly-elected officers must procure all blanks, documents, etc., from their predecessors.

25. Unions should never assume to pay the funeral expenses of deceased members until first assured that the claim is allowable.

26. Preserve old due cards. They may be useful for reference in case of dispute over dues, etc.

27. Members should always when attending meetings of the Union have with them their Constitution and By-Laws; also their due card.

28. Parties making statements in reference to recreant members will be held responsible for statements sent in for publication.

29. Matter for the ELECTRICAL WORKER must reach the general office by the 10th of each month.

As we are about to open a new roll book we request all Secretaries to furnish us soon as possible a complete roll of their members since their Union was organized. Some of the Unions with a membership of 100 to 200, according to the Financial Secretary's report, have less than twenty entered on the books at the general office, and none outside of those twenty would be entitled to death benefits.

Send in the name of every member initiated since the Union was organized, even though long since suspended or expelled. This is necessary, as we must have a correct record of every member who ever belonged to the Brotherhood.

There has probably never been any invention that the electrical world can boast of so loudly, or that is such a wonder to the entire thinking world as the search light. "It might seem ridiculous to those who do not understand it when you tell them that the candle power of a couple of the ordinary search lights goes up into the millions, and in some cases the tens of millions. Yet this statement is fully borne out by the facts. Of course, the lamp does not give such an enormous candle power when it is measured in itself. But take the search light as it is used with the great magnificent lens, which contracts all the light and throws it in a single direction, and the intensity of the light is so great that it is quite impossible to compute it. For instance, the candle power of the big search light to be used at the World's Fair is 150,000 alone, the carbons are to be 12 inches long and 1 3-16 inches in diameter. When this is surrounded by that reflector, 4 feet in diameter, the candle power at once mounts up to 460,000 candles.

INVENTOR P. KENNEDY'S new storage-battery motor proved to be a success in a most difficult street railway test in New York recently, making twenty miles an hour at a cost of nine cents a car per mile.

The columns of the ELECTRICAL WORKER are always open for the discussion of any question in which the interest of the electrical workers or the electrical industry are at stake.

RECORD OF ELECTRICAL PATENTS FROM JAN. 1ST TO DATE

- 489,464, J. H. Crosby, electro-steam valve attachment.
489,431, Ernest H. Jenkins, electric railway trolley.
489,505, W. L. Silver, journal bearing for dynamos.
489,519, M. O. Anthony, automatic coin actuated feed and return mechanism for phonographs.
489,522, W. C. Cahall, galvanic battery.
489,526, H. M. Doubleday, electric lighting system.
489,551, C. N. Waite, electrical diaphragm for electrolytic cells.
439,533, G. Baehr, electrical switch.
489,559, G. L. Foote, galvanic battery.
489,563, D. E. Kimball, electric railway.
489,570, -489,571, C. E. Scribner, spring jack switches.
489,573, G. W. Von Siemens, conductor system for electric railways.
489,597, F. B. Badt, multiphase electric system.
489,598, F. B. Badt, electric lighting for electric street railways.
489,603, J. L. Davidson, attachment for telephones.
489,616, A. M. Sloss, electric gas light.
489,625, S. G. Brinkman, electrically controlled ventilator.
489,629, W. F. Z. Desant, railway signal.
489,666, E. L. Wilson, sound recording instrument.
489,638, L. McCarthy, strain insulator.
489,638, C. H. Bryan, electric battery.
489,677, J. Greenwood, production of chlorine and caustic soda.
489,687, Ott & Kennelly, controlling electric motors.
489,709, Carl Hering, variable speed electric motor.
489,736, J. F. Geary, railway signal.
489,739, L. H. & L. N. Dalysson, socket switch for incandescent lamp.
489,764, Sheldon, Murnane & Van Beek, underground electric railway.
489,832, W. R. Rend, galvanic battery.
489,835, C. A. Stark, closed conduit electric railway.
489,861, G. H. Bennett, blanket for electric light wires.
489,902, W. S. Hull, electric prison cell and guard.
489,913, F. J. Agabeg, fan.
489,916, A. Baker, apparatus for preserving foods.
489,938, J. H. Davis, electric battery.
489,944, A. C. Goetz, electric railway switch.
489,983, W. B. Potter, electric cut-off.
489,990, C. E. Scribner, telephone.
490,011, F. J. Dibble, electric motor.
490,012, F. J. Dibble, electric telemeter transmitter.
490,013, F. J. Dibble, electric telemeter transmitter.
490,014, F. J. Dibble, telemeter system.
490,034, T. E. Morford, electric heater.
460,064, F. H. Brown, telegraphy and telephony.
490,031, J. F. McLaughlin, commutator brush and holder.
490,072, J. F. McLaughlin, electric heater.
490,061, J. A. Nadeau, electric alarm lock.
490,178, Elihu Thompson, electric circuit breaker.
490,183, C. O. C. Billberg, a commutator brush.
490,202, G. E. Hunter, testing watch balances and hair springs.
490,203, G. E. Hunter, method of testing watch balances and hair springs.
490,231, N. M. Powell, electric battery.
490,256, G. R. Meitzler, electrically heated soldering iron.

ELECTRICAL PATENTS EXPIRING JAN. 11, 1893.

- 172,218, automatic electric fire alarm, W. B. Watkins; 172,219, 172,220 and 172,221, fire alarm telegraphs, W. B. Watkins.
171,998, L. S. Crandall, telegraph key.

THE Edison Co. of St. Louis, must confess. It recently increased its capital \$5,000 to \$3,500,000. If it were not that it paid the Secretary of St. increase, it would look like General Electric Co.

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ELECTRICAL

TRADE NOTES.

Shultz Belting Co., of St. Louis and the rest of the earth, are now busy manufacturing an eighty-inch belt, which when completed will be the largest in the world. The statistical fiend has worked out the problem and avers that the Shultz Belting Co. have actually, during their long business career, manufactured enough belting to connect the earth and moon, so that their trade-mark is something more than a myth.

The Laclede Power Co. report the sale of some large C. & C. motors. C. & C. motors furnished by this company are now doing all kinds of work in this city, such as running printing presses, elevators, etc.

Western Electric Supply Co. report a splendid past year's trade, and the increase in space and doubling of forces, and the continuous incoming and outgoing of immense quantities of supplies of all kinds, show an ever increasing business. Anything manufactured for the electrical trade can be found at the Western Supply Co.'s place at 619 Locust street.

The Municipal Electric Light & Power Co., with the largest central station in the world, thoroughly equipped with the most approved arc and incandescent machine, can always be relied on to furnish their patrons with the best light in the market.

Van Nort Bros. have just opened up large quarters at 718 Market street, and are rushed with work, both in the construction and supply departments.

Acme Oil Filter, 730 N. Main.—Over 500 sold in less than eighteen months makes a very good showing. Under the able management of Mr. Flower the 1000 mark is plainly visible in the near future. His liberal offer to send one on a thirty days' trial shows his faith in the superiority of the Acme Oil Filter. Send for a catalogue.

Home Novelty Co. of Tenth and Walnut have an electrical curiosity shop; an underground electric road, a horizontal arc light and an entirely new electric pen are a few of the electrical novelties manufactured by the Home Novelty Co.

Interstate Complete Electric Construction Co., occupying Heisler's old factory, 809-817 S. Seventh street, are very busy filling town and country orders, and are fully equipped to estimate and complete large or small contracts.

A. M. Morse & Co. of 520 Olive have an extensive experience in designing and building power plants for electric light stations, electric railways and various manufacturing establishments, and have built many of the central lighting and power stations in prominent cities of Missouri, Illinois, Kansas and Texas. They can also refer to many isolated plants in St. Louis and Kansas City. They solicit correspondence and will mail catalogue and complete lists of the Buckeye engine on application.

Rose Electric Light Supply Co., 1106 Pine, carry an immense stock of new and second-hand supplies of all kinds, and have had a very busy year, with good prospects of doubling their business this year. Send for their catalogue.

Grandall Packing Co., 520 N. Third have only lately introduced their patent packing to the Western public, but can already refer to some of the largest plants in and out of town. Send for descriptive catalogue and sample.

Werner Engraving Co., 24 and 26 S. Third, are wood, photographic and half-tone engravers, and several specimens of their work can be found on other pages of this paper.

Fred Dresel, 301 Market, general engraver and die-sinker, is closing up last year's business with a comfortable balance at his banker's. He is one of the pioneers of his trade in this city.

W. H. Haskell, 713 Olive, engraver and jeweler, is a specialist in the manufacture of emblematic buttons, pins, charms and badges, and has probably furnished more original designs for the use of secret societies, lodges, unions, etc., than any other man in the West.

E. Spangenberg, 314 N. Third, has a very successful engineering school, which is open daily from 9 A. M. to 10 P. M., excepting Sunday nights. His classes are well filled and his pupils are practical engineers when through their course, and find no trouble in getting situations as such.

H. Remmers & Son, 1108 and 1110 St. Charles, are pioneer pattern and model-makers, and do most of the work for all the large electrical supply houses. They are also specialists in making models for new inventions.

Higdon, Higdon & Longan, patent lawyers, report a large increase of electrical patents and claim the wild and woolly Westerners are out-doing the effete Easterners in valuable inventions.

Hurst Air-Space Covering Co., 719 N. Main, have a new thing and a good thing, which they are successfully introducing to the trade.

Knight Bros., Se. Cor. Broadway and Olive, are very successful patent lawyers, and have secured many valuable patents and trademarks for their customers. They report that electrical patents are booming.

Stagl Electric Engineering Co. have done a larger business than ever during the past year. They recently finished the electrical work on the palatial residence of Adolphus Bush, and are now wiring the new Columbia Building. They have contracts enough on hand to keep a large force of men busy for some time.

We are indebted to R. F. Harding, patent lawyer, of Washington, D. C., for our very complete list of electrical patents, which most of our readers will doubtless peruse with profit to themselves.

Fowler & Fowler, patent lawyers, are handling some very fine electrical patents, some of which will surprise electricians, and will net thousands of dollars to the inventors.

To those interested in electricity: Subscribe to the ELECTRICAL WORKER—one dollar per year in advance.

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FOR THE



ELECTRICAL WORKER

OFFICIAL JOURNAL OF THE
National Brotherhood of Electrical Workers.

The only electrical paper published in St. Louis. Contains the latest news of patents granted or run out, new plants and corporations, with original articles and latest items of interest to all persons interested in electricity.

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